Safety Maintenance

and Production

EST. 1901 AMERICA'S PIONEER MAGAZINE IN ITS FIELD

FIFTY CENTS MARCH, 1954

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SAFETY PRODUCTS DIVISION

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Keep your workers in the Safety Zone with American Optical Safety Equipment

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

(For full details, use Key # P-1 on free Inquiry Card on page 77)

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Send for FREE sample on your company letterhead.

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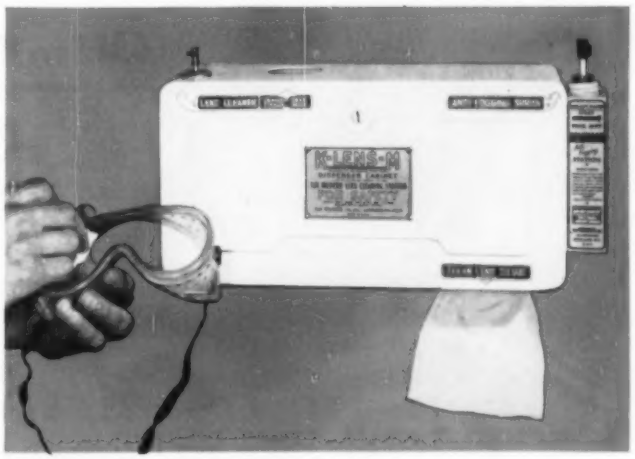

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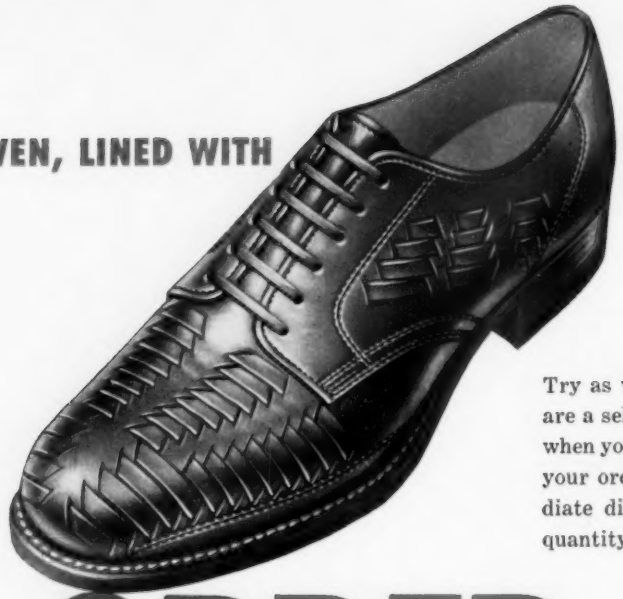

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SAFETY MAINTENANCE & PRODUCTION

FORMERLY "SAFETY ENGINEERING"
EST. 1901

VOL. 107, NO. 3 **MARCH, 1954**

EDITORIALS

Slaughter in Public 6

ACCIDENT PREVENTION

A "Before," Not "After" Eye Program (eye protection series) by JOSEPH E. NICHOLS 14
Two Hits To Hats 19
The Safety Engineer's "Occupational Disease" ... by EVERETT W. MARTIN 22
The Winner Is Safety! ..... by FORREST K. VAN HORN 24
Outdoor Safety Signs Attract Attention 29
New Safety Products 73
New Safety Bulletins 77

MAINTENANCE

Fifth Plant Maintenance Show 13
Lighting Maintenance Gets A Lift (lighting maintenance series) by M. E. MITCHELL 20
New Maintenance Products 73
New Maintenance Bulletins 77

INDUSTRIAL HYGIENE

Industrial Hygiene News 53
Noise Measurement and Analysis (noise control series) by VICTOR H. POMPER 54
Cardiacs Can Work 57
The Industrial Nurse 63
New Industrial Hygiene Products 73
New Industrial Hygiene Bulletins 77

FIRE PROTECTION

The Fire Front 45
Fire Losses For 1953 45
Going Up! . . . But Not In Flames! 51
New Fire Prevention Products 73
New Fire Prevention Bulletins 77

SPECIAL DEPARTMENTS

Check List of Aids to Production 4
The Future Shows 8
"Safety Maintenance" Salutes A Safety Idea 28
Inside The Trade 32
"My Safety Shoes"—A Safety Illustration 35
What's the Law? 37
Safety Achievements 40
Transportation Safety 42
Learning The Hard Way 67
What's New in the Safety-Maintenance Field 73
Free Bulletins & Catalogs 77
Reader's Free Inquiry Card 77
Index to Advertisers 78

PICTURE CREDITS
Our Thanks for the Courtesy
Cover: General Electric Co. (See page 38)

AMERICA'S PIONEER MAGAZINE IN ITS FIELD

SAFETY MAINTENANCE & PRODUCTION is indexed regularly by Engineering Index, Inc., New York

New Safety Aluminum Extension Ladder is Easy to Carry, Lasts Longer

Weighing only 1¾ lbs. per foot, this strong, lightweight Safety Aluminum Extension Ladder is easily carried, even in the longer lengths. The corrosion resistant aluminum offers unusual durability; is immune to rust, rot or mildew. Strong, interlocking-channel side rails assure trouble-free extension. Positive self-locking safety locks (see illustration) are easily adjusted at any height. Rungs are double-bolted to rails, and have heavily serrated top edges to prevent slipping. Combination type feet have super grip rubber treads and self-sharpening spikes. Available in 16′, 20′, 24′, 28′ and 32′ lengths. Bottom section is available for use as a single ladder. Write for free Bulletin L-76.

New Safety Aluminum Stepladder is Securely Braced

Designed for maximum safety and strength, this easily-handled Safety Aluminum Stepladder weighs only 2¾ lbs. per foot. Heavy-duty steps are double riveted to extra rigid, channeled side rails. Deeply grooved top and steps prevent slipping. Safety-type spreaders never pinch fingers. All four legs have heavy-duty rubber boots to protect floors and prevent slipping. Available in 4′, 5′, 6′, 7′, 8′ sizes. Write for free Bulletin L-76.

PS Co. offers a complete line of safe, easy-to-handle magnesium ladders as well as famous "Gold Medal" wood ladders. Write for free Bulletin L-70 and Catalog L-71.

GOLD MEDAL LADDERS SCAFFOLDING — *FOR GREATER SAFETY...EFFICIENCY...ECONOMY*

THE PATENT SCAFFOLDING CO., INC.

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(For full details, use Key # P-4 on free Inquiry Card on page 77)

Check List of Aids to Production:

Through Safety—

Eye Safety Program 14
Hard Hat Protection 19
Accident Prevention Incentive Program 24
Cylinder Roll Control 28
Outdoor Safety Signs 29
Three-Ply Asbestos Mitten 73
Lightweight Waterproof Suit 73
Plastic Ear Plug 74
Safety Training Aid 74
Head Gear Mounting 74
Press Safety Control 75
Job Classification Test 75
Insulated Rubber Gaiter 76
Free Safety Bulletins 77

Through Maintenance—

Maintenance Ideas 13
Maintenance Lift Truck 20
Rolling Step Ladder 75
Lamp Reflector 75
Hand Lift Platform 76
Compact Floor Machine 76
Free Maintenance Bulletins 77

Through Industrial Hygiene—

Noise Measurement and Analysis 54
Cardiac Employment 57
First Aid Units 73
Plastic Ear Plug 74
Elastic Knuckle-Band 76
Free Industrial Hygiene Bulletins 77

Through Fire Prevention—

Dry-Chemical Extinguishers 51
Glass-Fiber Hose 73
Fire Instruction Sticker 74
Hose Shut-Off 76

NO WONDER BUYERS SAY

"Well I'll be . . . ."

FOR ALL THIS DOES NOT COST A PENNY MORE.
IN FACT, IT COSTS A GREAT DEAL LESS.

1

American industry's swing to MAGIC LENS TISSUE (Silicone treated) is one of the greatest success stories of the Safety field. Each sheet is over 50% larger than usual. Yet Magic costs you less. $8.40 per Carton (6 refills per carton). The compact Dispenser is only $2.50.

2

And here is our MAGIC HEAVY DUTY Cleaning Station for mines, foundries, heavy-grit areas or where ANTI-FOG protection is necessary—on plastic goggles, safety shields or any eyewear.

First we developed today's finest cleaning and anti-fogging compound, and proved its superiority by government tests in one of the world's leading laboratories. Then we Pressure-packed it. About 1,400 applications per can. Each 12-oz. can contains twice as much fluid as old-fashioned 6-oz. bottles and, in addition, the pressure packing makes it go twice as far. So, 1 MAGIC CAN EQUALS 4 SUCH BOTTLES. Dollar for dollar, that is the first great saving.

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Indestructible, 20-gauge steel Dispenser locks the can in place, protruding and unobstructed where it can be used best. No pilferage possible. So compactly and ingeniously built, including ample space for tissue disposal, that whereas ordinary cabinets cost ten or twelve dollars this superior cabinet costs only $5.95. Releases each sheet only 1-by-1, not in bunches, and enormously reduces waste. Ask us to exchange this dispenser for whatever you have and you will see.

The paper, not silicone-treated, is our superb, super-strong, wet-strength tissue. Naturally, no scratching on plastics or anything else, and no lint. Here again notice the great saving. Instead of a few sheets in little boxes, Heavy Duty carton contains 18 giant refills (each refill has 760 jumbo-size interfolded sheets 8″ by 4¾″) at only $11.60 per carton. All prices F.O.B. our plants.

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BOTH BEST FOR YOU

(For full details, use Key # P-5 on free Inquiry Card on page 77)

It's Safe to Say

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★ SLAUGHTER IN PUBLIC

PUBLIC apathy to street and highway safety problems is costing this nation thousands of lives every year according to the President of the United States.

In pin-pointing this apathetic attitude, President Eisenhower addressed the opening session of the White House Conference on Highway Safety in Washington last month. He warned against the lack of coordinated effort by citing as a good example of coordination the work of organizations operating effectively to accomplish other worthy goals. This is done, he said, to seek ways for peace and thus prevent indescribable tragedy.

The President emphasized the shocking toll of street and highway fatalities by reminding Conference Delegates that we have lost more lives to motor accidents within the past 50 years than in all the wars we have waged put together.

War-time casualty lists with their undertones of heartbreak can be dramatized in the daily press to demonstrate the tragic sacrifices of war. Infinitely more futile is the loss of life due to the utterly senseless slaughter on our streets and roads.

The President predicted that there would be more than 80,000,000 motor vehicles in use in this country by 1975 and while the government is doing its part to help build more and safer highways, with this number of vehicles on roads, he said he wondered how delegates would even get to safety conferences to consider the problems of highway accident control.

President Eisenhower urged that community groups be established all over the country in order to gain the respect and utmost cooperation of all citizens within the areas organized. As a result, he said, representatives of law enforcement agencies would realize that they had wide public support.

Secretary of Commerce Weeks said that directly or otherwise, all communities paid for traffic accidents but that the burden falls most heavily on those states where sound preventive measures are lacking.

The safety problem has assumed its present size, Secretary Weeks said, because too many localities are slighting or neglecting important factors for protective procedures. Nation-wide, the country has never carried out more than 60 percent of what might be termed the minimum recommended program, he added.

In analyzing driver attitudes, the Conference was reminded that too many boors are behind the wheel of a motor vehicle. Obviously this is so because we know that many drivers become utterly devoid of decency or common courtesy the moment they take command of the driver's seat.

Another cause of highway accidents is shoddy law enforcement as manifested by inadequate penalties. Just recently, an unlicensed driver in a large eastern city was fined ten dollars for driving while intoxicated. Imagine this puny form of punishment meted out to a potential murderer!

Efforts to build greater safety into motor cars, improve safety devices and enlist the aid of safety-minded citizens in all communities will do much to curb an annual loss of some 38,000 lives snuffed out on our streets and highways.

It would seem that plant management and industrial safety experts could perform no greater public service than to carry over their accident-prevention thinking to the problem of death on our roads and streets. By engaging actively in the work of highway safety in their respective communities, they would be safeguarding jobs, the nation's resources and often the lives of their own families.

A welder, rigger, mechanic or shop foreman killed on a public highway represents a loss every bit as great as if he met with a fatal accident within the confines of his working place. Too often the loss is far greater when the victim of a motor vehicle accident is accompanied by his wife and children.

Industry has learned that plant accidents just don't "happen." It's high time that we who use the streets and highways make the same discovery.

President Eisenhower deserves the thanks of the entire country for his personal efforts to show the world that the lives of our citizens are our most cherished asset. But government alone cannot guarantee highway protection. Here we have but another example of the truism that safety everywhere is a cooperative venture guaranteed to help us all. H.A.

It could have been his eye...

BAL-SAFE LENSES MAKE THE DIFFERENCE

Your foresight may save a man his eyesight.

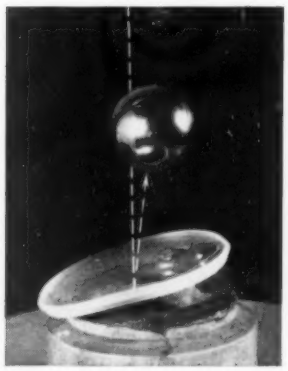
The accident blow is sudden! Whether the result is an injured eye, or merely a cracked lens —it happens in a flash. Then the person responsible for eye safety is either *on the spot*—or to be congratulated.

Safety directors who specify Bausch & Lomb Bal-SAFE lenses rest assured they're providing the *most dependable eye protection available.*

Impact resistance to an extraordinary degree is built into Bal-SAFE lenses through a precision controlled heat treating process that radically changes and strengthens the glass structure. Every lens exceeds the U.S. Bureau of Standards requirements for impact resistance. Of finest quality ophthalmic glass, from the world-famous Bausch & Lomb Glass Plant, they're made to the same rigid specifications as regular ophthalmic lenses.

For workers who wear or need prescription glasses, professionally prescribed Bal-SAFE lenses ground to individual requirements increase safety, comfort and efficiency. Swift, accurate, dependable laboratory service is available in your area.

The Bausch & Lomb representative in your area will be glad to show you the complete line of Bausch & Lomb Safety Eyewear. Call him today, or write for catalog: Bausch & Lomb Optical Company, 90527 Smith Street, Rochester 2, N. Y.



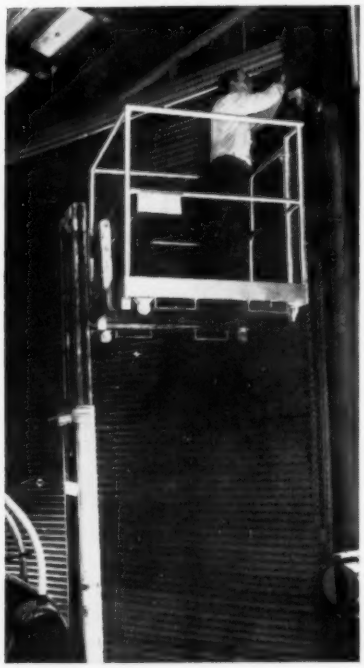
All Bal-SAFE lenses are tested at the Bausch & Lomb plant in accordance with specifications established by the U.S. Government Bureau of Standards, in which a 7/8" steel ball is freely dropped from a height of 50 inches on the horizontal outer surface of the lens. Actually, Bal-SAFE lenses far exceed the impact resistance requirements of the Government.

BAUSCH & LOMB

SINCE B&L 1853

(For copy of catalog, use Key # P-6 on free Inquiry Card on page 77)

SOMETHING NEW for fork-lift trucks!



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The new HECO Safety Work Platform is a mobile fork-lift attachment which provides easy access in hard-to-get-at, elevated work areas. Equipped with a strong, chest-high safety railing on four sides, this work platform is built according to state safety standards. It weighs only 100 lbs. and is set on casters so it is easily rolled by hand. You'll discover the HECO Safety Work Platform prevents accidents and saves you money, time and labor. Write for further information, or —

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JUniper 7-1357

(Use Key # P-7 on Inquiry Card on page 77)

THE Future SHOWS

Louisville, Ky. *March 7–9*

Southern Safety Conference & Exposition (Kentucky Hotel). W. L. Groth, Executive Director, P. O. Box 8927, Richmond 25, Va.

Philadelphia, Pa. *March 10–11*

Twentieth Annual Philadelphia Regional Safety and Fire Conference and Exhibit (Bellevue-Stratford Hotel). Walter W. Matthews, Managing Director, Philadelphia Chamber of Commerce Safety Council, Architects Building, 17th and Samson Streets, Philadelphia 3, Pa.

Indianapolis, Ind. *March 17–18*

Seventh Annual Central Indiana Safety Conference and Exhibit (Claypool Hotel). Indianapolis Safety Council, 320 North Meridian St., Indianapolis 11, Ind.

Boston, Mass. *March 22–23*

Thirty-third Annual Massachusetts Safety Conference and Exposition (Hotel Statler). Edgar F. Copell, President, Massachusetts Safety Council, 31 State Street, Boston 9, Mass.

Dallas, Texas *March 29–30*

Fifteenth Annual Texas Safety Conference (Baker Hotel). E. B. Tilley, Texas Safety Association, Inc., 830 Littlefield Bldg., Austin, Texas.

Los Angeles, Calif. *March 29-31*

First Annual Southern California Safety Congress and Exhibit (Ambassador Hotel). Joseph M. Kaplan, secretary, Greater Los Angeles Safety Council, 610 S. Main St., Los Angeles 14, Calif.

Pittsburgh, Pa. *March 30–31*

Twenty-ninth Annual Western Pennsylvania Safety Conference and Exhibition (Hotel William Penn). Harry H. Brainerd, Executive Manager, Western Pennsylvania Safety Council, 605 Park Bldg., Pittsburgh 22, Pa.

New York, N. Y. *April 6–9*

Twenty-fourth Greater New York Safety Convention and Exposition (Hotel Statler). George E. Decker, Lincoln Building, 60 East 42nd St., New York 17, N. Y.

Charleston, W. Va. *April 14–16*

Twentieth Annual West Virginia Safety Conference. Charles Hopkins, West Virginia Safety Council, 316–17 Masonic Office Bldg., Charleston, W. Va.

Columbus, Ohio *April 20–22*

Twenty-fourth Annual All-Ohio Safety Congress & Exhibit (Deshler-Hilton Hotel). James H. Fluker, Div. of Safety & Hygiene, Industrial Commission of Ohio, Columbus 15, Ohio.

Detroit, Mich. *April 20–22*

Michigan State Safety Conference (Sheraton Cadillac Hotel). Jerry Moore, executive secretary, Corporate Service, Inc., Detroit, Michigan.

Buffalo, N. Y. *April 20–22*

Fourteenth Annual Western New York Safety Conference and Exhibit (Hotel Statler); executive secretary, Eugene C. Hohlstein, Blaw-Knox Co., Buflovak Equipment Div., 1543 Fillmore Ave., Buffalo 11, N. Y.

Fort Wayne, Ind. *April 27–28*

Northeastern Indiana Safety Con-

(Continued on page 10)

Don't Clean Your Floor By Destroying It!

Harsh so-called fast cleaners work by ATTACKING soil and your floors.

Depend on the Superior Cleaning of SUPER SHINE-ALL Safe for all Floors

It's gentle, fast action penetrates, lifts and floats away dirt and grease—is non-reacting to ANY floor.

Impartial tests by two of the world's largest Manufacturers PROVE the superiority of SUPER SHINE-ALL.

PLACED

FIRST—in grime removal
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FIRST—in ease of use
FIRST—in resisting grime (length of time surface stayed clean)

. . . and Super Shine-All floors look as good today as they did 20 years ago.

SUPER SHINE-ALL cleans more ways Achieves 100% Cleansing Action without rinsing to Save Labor Costs

1. by *wetting* action—reduces surface tension of water providing rapid penetration.
2. by *penetrating* action—to go deep beneath the dirt layer.
3. by *sudsing* action—produces rich cleansing suds that spread out and clean thoroughly.
4. by *emulsifying* action—breaks up fats and oils into small particles to mix with water, permitting gentle agitation instead of hard scrubbing.
5. by *suspending* action—to lift and suspend solids as dust, soot, rust, iron in liquid for easy removal.
6. by *dissolving* action—reduces water soluble material to solution.

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Please have Maintaineer in my vicinity call for free advice.....; my free copy of Hillyard's new Super Shine-All folder.....

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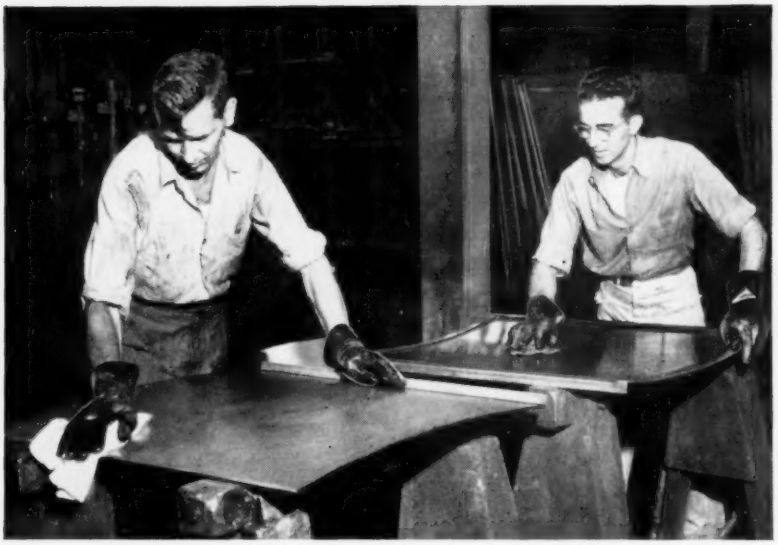
City ..... State .....

(For copy of folder, use Key # P-8 on free Inquiry Card on page 77)



Edmont Case No. 329: Cleaning and acid-etching fabricated cab sections for cranes and shovels, prior to painting. A hazardous operation with ordinary unlined gloves because of the sharp metal edges. Edmont No. 922 gauntlets have been safely used for years. Their NEOX (reinforced neoprene) coating resists cutting and snagging as well as the acid; their soft flannel lining prevents skin irritations. For further economy, right and left hand gloves are individually replaced as they become worn out.

On big power shovels...

Preparing metal for paint is no problem, with job-fitted gloves

If you bought a big power shovel or mobile crane, to work outdoors in every kind of weather, you'd want it to have one of the best protective paint jobs money could buy.

To provide that kind of paint job on its famous "Lorain" cranes and shovels, The Thew Shovel Company pretreats its fabricated sections with acid, which insures a strong bond for the paint.

The problem of handling the sharp-edged sheets and plates in the acid, 8 hours a day, without hand injuries or skin irritations, is no problem at all. For years, Thew's safety-and-cost-conscious management has standarized on *job-fitted* Edmont gloves. The glove used on this operation is coated with cut-resistant, acid-proof NEOX. It has a good grip, is flexible and comfortable to wear. As always, this job-fitted glove has minimized costs through longer wear, better work handling, greater safety and resulting employee satisfaction.

NEOX, natural rubber and plastic coatings — Over-all coated or palm coated—34 types

Free Test Offer: We are interested in helping you fit the correct gloves to your jobs. Send a brief description, on your business letterhead, of your operation, materials handled and temperature conditions. Without cost we will recommend and forward samples of gloves, for job-testing. Our laboratory also develops special gloves for conditions which our 34 standard types do not meet. Address

Edmont Manufacturing Company, 1256 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves, available through all leading industrial suppliers.

Edmont

Edmont job-fitted gloves

(For full details, use Key # P-9 on free Inquiry Card on page 77)

Future Shows (Cont'd)

ference & Exposition. Ivan A. Martin, manager Fort Wayne Safety Council, Chamber of Commerce of Fort Wayne, Fort Wayne 2, Ind.

St. Louis, Mo. *April 27–29*

Central States Safety Conference and Exhibit (Hotel Chase). Reyburn Hoffman, The Safety Council of Greater St. Louis, 511 Locust Street, St. Louis 1, Mo.

Raleigh, North Carolina *May 4–6*

Twenty-fourth Annual North Carolina Statewide Industrial Safety Conference (Sir Walter Hotel). H. S. Baucom, Safety Director, North Carolina Industrial Commission, Raleigh, North Carolina.

Baltimore, Md. *May 6–7*

Annual Governor's Safety-Health Conference & Exhibit (Lord Baltimore Hotel). Joseph A. Haller, Safety Director, State Industrial Accident Commission, Equitable Bldg., Baltimore 2, Md.

Chicago, Ill. *May 12–14*

Greater Chicago Safety Conference & Exposition (Sherman Hotel). Joseph F. Stech, Manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2, Ill.

Groton, Conn. *June 1–2*

Ninth Annual Connecticut Industrial Safety Conference (Griswold Hotel). John W. Kent, manager, Connecticut Safety Society, 26 Chaucer Court, Woodmont, Connecticut.

York Harbor, Maine *Sept. 16–17*

Twenty-seventh annual Maine State Safety Conference. (Marshall House). A. F. Minchin, Secretary, Industrial Safety Division, Dept. of Labor and Industry, Augusta, Me.

NEOPRENE Soles and Heels

Second of Five

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are the longest wearing, largest selling soles and heels of their kind.

For all Safety Shoes—Work or *Dress* Type made in 12 and 18 iron

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VISOR-TUC

MODEL 422 CSC

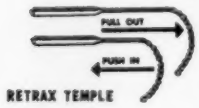
Almost 100% protection — plus all the comfort of "Tuc-Away"

"Visor-Tuc" fits snugly against wearer's forehead to provide over-eyes protection from glare and flying particles.

Shatterproof, semi-cup Eye Savers Lenses prevent entry of particles from side and bottom.

COMFORTABLE — *Easy to Wear*

"Visor-Tuc" weighs hardly more than an ounce . . . rests lightly on the nose . . . Universal nosepiece assures comfort. Retrax Temples in metal (Model 422) or plastic (Model 425) can be adjusted instantly by each worker to suit the shape of his face . . . long or short, wide or narrow. Optically correct, Methyl Methacrylate Eye Savers lenses prevent eye strain and permanent injury resulting from distorted image.



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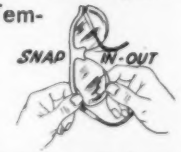
"Visor-Tuc" initial cost is lower . . . maintenance less. Inventory is reduced. Single frame style fits all workers . . . thanks to Retrax Temples and Universal nosepiece. Replaceable lenses are easily removed and inserted by the wearer and are interchangeable in both "Visor-Tuc" and "Tuc-Away". Lenses are available with regular side shield, long (1") side shield or semi-cup, in clear or light, medium and dark green.



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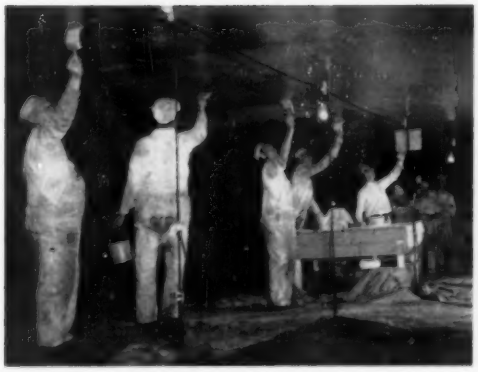
SAFETY MAINTENANCE & PRODUCTION

VOL. 107, No. 3 • MARCH, 1954

5th Plant Maintenance Show



ATTENDANCE at the 5th Plant Maintenance & Engineering Show reached the impressive figure of more than 19,000 delegates. This total registration rose nearly 20% over last year. Speakers brought the delegates up to date on maintenance problems:

In order to get a maintenance program into being, management must be sold on its results. What sort of results does management want? . . . economical long range costs, an efficient organization, optimum production, maintenance performed in a safe, orderly, and effective manner, and themselves informed of progress.

Beginning with these premises, K. W. Pratt, mechanical superintendent, titanium division, National Lead Co., went on to suggest that economical costs could be achieved by improved maintenance methods, improved materials, alterations in equipment to lower maintenance costs, and the proper selection of new equipment for efficient maintenance. The primary factors in establishing a sound organization Mr. Pratt considered were defining the scope of departments, selecting the proper men for the jobs, training them to fit the jobs, keeping them informed, their morale high, and permitting subordinates to assume full responsibility for their jobs.

Performing maintenance safely, effectively, and with order involves preventive maintenance, routine maintenance, cyclic maintenance, and non-recurrent or one-time maintenance, according to Mr. Pratt. He adds that cooperation with the production department on shut-downs and other phases will help the maintenance department convince management that its program is not cutting production. Mr. Pratt emphasized informing management before rather than after something has happened. Forecasts, follow-ups, annual and other routine reports, plus special reports on emergency changes and constant verbal informal contacts with management personnel were also advised.

Giving management the sort of results it wants also requires intelligent cost control and budgeting of maintenance. George E. Meyers, maintenance specialist, proposed a cost control program which requires a written order for most maintenance jobs, a timekeeping

(Continued on page 26)

A "BEFORE" EYE P

By JOSEPH E. NICHOLS
Safety Director
Reynolds Metal Co.
Richmond, Virginia.

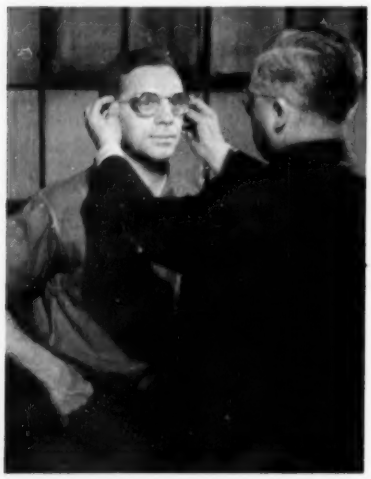
WHY the emphasis on sight conservation? The answer is simple: 80 percent of our actions as we live and work and move about are guided and controlled by our eyes.

Unfortunately, eyesight is so much taken for granted that it suffers seriously from lack of even ordinary attention and care. Most people brush their teeth regularly, and see a dentist once or twice a year. Most people get first aid for minor cuts and bruises, but how many people have their eyesight checked regularly or try to obtain glasses before they cannot read the fine print.

This lack of attention to proper care of eyesight is a common failing, and nearly all of us are guilty of it in some degree. It would be a staggering job to attempt to re-educate everyone to an intelligent attitude, but there is another way of attacking the problem and it is a way that is being adopted increasingly by industry. It is through planned programs of eyesight conservation that we have a wonderful opportunity to improve our employee relations, improve safety, improve efficiency and to enhance the value of the industrial nurse.

Industrial nurse and safety engineer inspect eye protection and guard on the job.

Sight-screening device enables trained personnel to fit eyesight to employment.



Safety goggles require proper adjustment for comfort as well as correct protection.

Trained employee with portable equipment keeps plant's eye protection in good shape.

So that we may properly evaluate the true place of a sight conservation program, consider one serious weakness in many employee relations programs. When a person is hired into a plant to fill a job, his services are, in effect, being purchased as a commodity. The employment office is but a specialized extension of the purchasing department. It buys the time of the employee for a certain number of hours each day. It buys all the physical services he is capable of giving. It is buying his brain power, his muscle power, his sense of touch, of hearing, his finger dexterity, or perhaps some special skill that he possesses. It is asumed, virtually without checking, that he has these abilities to some degree. It is assumed also that he has eyesight, without which most of his other physical abilities would be of much less use. If the applicant has only one leg, or some fingers missing, it is easily apparent that his usefulness as an employee is definitely limited. It is impossible to find two human beings alike; some are tall, some have big feet, others just the opposite. Some have brilliant minds, some have strong backs. Some have stomach trouble, while others are

FEATURE

First of a series of feature articles on Eye Protection. Next articles will appear in the April and May issues of SM & P.

ROGRAM NOT "AFTER"

out a little slip of paper stating, in effect, that he needs one man for a certain job. He does not say whether the man is to be tall or short, strong or weak, have good finger dexterity or good eyesight. This seems like a most inefficient procedure for such an expensive and hard to get commodity as a good employee.

Some of the things industry would most like to do are improve the efficiency of its labor, reduce accidents and boost morale of the workers. A program of eyesight conservation is one of the parts of an overall policy of industrial plants today. Eyesight conservation programs are not new. There are many notable examples of these programs that have been carried out by some of the leading industrial companies that have produced results that are amazing, but which are now known to be possible in almost any industrial establishment. Such programs have been difficult to "sell" to management, and one of the reasons is that they have the appearance of some of the "frills" of industrial

allergic to many things. Why then, should it be supposed that they all have equal visual ability? They don't.

It is estimated that about one person of each 10 hired into industry is given a vision check using some form of a vision chart, at the time he is hired. Less than one in each 100 hired has a vision check of a more thorough nature. This lack of vision checking must be partly responsible for the fact that about 30 percent of all industrial employees today are working with something less than good vision! It may seem incredible, but it has been proved many times by competent testing procedures that an average of nearly one-third of all industrial employees today are working with vision less than adequate for their jobs.

Every purchasing department operating today takes great pains to write up their purchase orders at great length and in detail so that the goods which they purchase will fit needs and specifications. There are testing laboratories and inspectors to receive the purchased materials and make sure they are what was ordered. Faulty and damaged goods are returned to the seller promptly.

Contrast this with the method of hiring a new employee! A foreman or superintendent customarily makes

practices. Also, the need for such a program varies to a considerable degree with the type of industry considered. During the past 3 or 4 years, however, there has been a marked increase in the number of programs being installed in industrial plants.

In our company, endless reports of accidents for which there seemed to be no reasonable cause suggested that the lack of good eyesight might be far more prevalent than we had suspected. Perhaps our employees could not see what they were doing. On this theory, we started a sight conservation program at one of our larger plants, and the results were so startling that executive management gave its support to similar programs throughout the company.

We quickly learned that the possibilities of improving production efficiency, reducing scrap losses, and cutting down rejected shipments were in themselves justification for the program. The biggest surprise, however, was the effect the program had on the morale of the employees. Many unsolicited letters were received from employees saying they sincerely appreciated the sight conservation program made available to them.

There are, of course, certain essentials which should be included in every eyesight conservation program, but there are a great many possible variations in the actual working of the program. The essential elements of a complete sight conservation program are:

1. A study of the types of eye hazards in the plant relating them to the protective equipment for each worker.
2. A plan for providing modern eye care through first aid facilities and services of an ophthalmologist.
3. Facilities for visual testing of employees and applicants.
4. Minimum standards of visual ability for each job classification.
5. Arrangements for the procurement of corrective or protective glasses for those who need them.
6. A careful study of plant lighting needs, including proper color plan, with an aim toward providing the optimum lighting throughout the plant.
7. Means of making the plan a continuously operating program through education of employees and management, analysis of results obtained, and prevention of disuse of the program.

From these essential points it should be quite apparent that the industrial nurse and the plant dispensary are the heart of the program. Sight conservation is, and should be, associated with general care of the health of the employee. It is logical to expect the nurse and the dispensary to be at the center of this activity. As a function of the overall plant policy for care of the employee's health, the eyesight conservation program divides itself into 3 parts.

The first of these is the use of the program for examining and screening applicants for employment to make sure that each person hired will meet the predetermined standards of visual ability.

The second function is to use the program for proper placement of workers within the plant. Standards of visual ability should be set up for each of the jobs in the plant and employees who fill those jobs are to be expected to have the physical ability to meet the standards. Such a plan is only logical, and it prevents such ridiculous situations as a very tall person working at a job where he has to stoop all day, or, for example, a telephone operator whose hearing is poor or a painter who is colorblind.

The third function of the program is its usefulness in maintaining eye health of employees. Visual abilities change with age and with the general conditions of a person's health. The keen eyesight which most people have at 20, for example, does not necessarily stay so keen during their working life, even if there are no accidents or injuries to the eyes. Regular check-ups or eye examinations are certainly an important part of any general program of eye conservation.

The eye testing procedure is simple and can usually be done in less than 15 minutes for each employee. The objective of the test itself is not to prescribe for glasses, not to make any optical measurements, but to determine whether or not the person taking the test has any visual defects which should receive the attention of a professional doctor. There are instruments which are being commonly used today for making these tests in the plant.

Protective equipment, such as safety glasses and goggles should be individually and carefully fitted to the person who will wear the equipment. It is rare that this fitting could be satisfactorily done any place in the plant but in the dispensary and by the nurse. The gripes and grievances which we are accustomed to hearing about the wearing of goggles could be almost entirely eliminated if proper care were given to the single matter of proper fitting.

Just as a safety program requires the constant cooperation of all the employees, an eyesight conservation program will not carry on by itself once it is started. Someone has to keep behind it and push. Here is another place in which the industrial nurse is all-important, because she can do much to make the program a success or a failure. There is no need for maintaining interest in the program through the use of posters and bulletins, and the company magazine, if there is one; and of course, the foremen and supervisory staff must be convinced of the value of the program so that they will secure the cooperation of their employees. A valuable help in maintaining this interest is the formation of a Wise Owl Club chapter in the plant, not only for day-to-day eye-safety, but for helping to maintain interest in the sight conservation program.

Everything that can be done to keep our workers in tip-top physical condition is a good investment for both management and employees. This includes eyesight conservation as an important and integral part of plant safety.

Pictures by courtesy of: first page, right, American Optical Company; upper, George Pickow-Three Lions; lower right, Tube Turns; second page, American Optical Company.

From an address delivered at the 40th National Safety Congress.

(For a copy of booklet described on opposite page, use Key # P-12 on Inquiry Card on page 77)

Machine shop of Dravo Corporation after being repainted according to COLOR DYNAMICS. This steel-framed structure, 483 feet long by 138 feet wide, is located on Neville Island, near Pittsburgh, Pa.

Pittsburgh COLOR DYNAMICS®

"One Of The Best Things That's Happened In Our Plant!"

Dravo Corporation's workers and management agree enthusiastically that functional use of color improves working conditions and increases productivity ...*Yet it costs no more* than normal maintenance painting!

AN OUTSTANDING EXAMPLE of the improvement in productivity and morale that results from the use of Pittsburgh COLOR DYNAMICS is the huge machine shop of Dravo Corporation, builders of heavy industrial equipment.

The activities in this shop include all machining and assembly operations required to produce individualized mechanical assemblies for river tow-boats, shipyard cranes, ore bridges and similar heavy machinery.

This plant was repainted according to COLOR DYNAMICS. The beneficial effects of this painting system are best described in these words of a Dravo Corporation spokesman:

"As the dull, drab gray was replaced by the modern, functional colors Pittsburgh carefully engineered for our requirements, workers enthusiastically commented, 'This is one of the best things that's happened in our plant!'

"Thus COLOR DYNAMICS provides a 'lift' for management-employee relations through improvement that can be seen, felt and appreciated. Further, there are dollars-and-cents advantages resulting from higher productivity at lower costs.

"Visitors constantly remark on the improved appearance. Therefore, we feel that COLOR DYNAMICS has enhanced customer as well as employee relations.

"Periodic painting of buildings and equipment is a maintenance necessity. That's why we consider these benefits from painting the COLOR DYNAMICS way as a highly desirable and worthwhile bonus."

Ask For Color Engineering Study Of Your Plant—It's FREE!

- Why not test the practical value of COLOR DYNAMICS in your plant—on a machine or two, or in a whole department? Send for our free book which explains how you can use this painting system simply and easily.
- Better still, call your nearest Pittsburgh Plate Glass Company and ask to have a representative give you a color engineering study of your plant, or any part of it, without cost or obligation. Or mail coupon at right.

Send For Free Book

Pittsburgh Plate Glass Co., Paint Div.
Department SMP-34, Pittsburgh 22, Pa.

☐ Please send me a FREE copy of your booklet, "Color Dynamics."

☐ Please have representative call for Color Dynamics Survey without obligation on our part.

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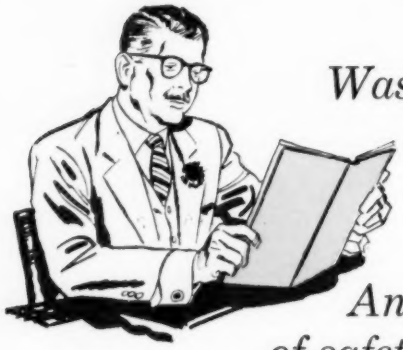
The day Du Pont Ludox® added "anti-slip" to waxes



Was the day alert executives found the answer to safer floors

And now there's a layer of safety underfoot!

Every step is safer when you use floor waxes made with "Ludox" colloidal silica. "Ludox" gives a unique snubbing action which heads off slips before they start. Yet waxes made with it may be even harder and have added depth of luster. Ask your maintenance man to specify floor waxes made with anti-slip "Ludox." Have him get in touch with your wax supplier today.

E. I. du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Department
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For Safety Underfoot, Specify Floor Waxes Made With

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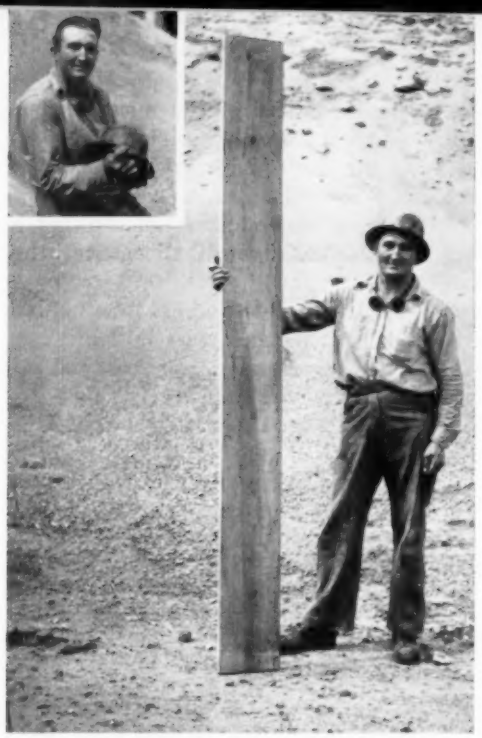
Better Things for Better Living . . . through Chemistry

Here's how LUDOX® works in floor wax

"Ludox" has tough, transparent particles of minute size. The pressure of a footstep forces the hard "Ludox" particles into the softer, larger wax particles. This action absorbs much of the foot's forward-moving energy . . . gives positive traction underfoot.

(For full details, use Key # P-13 on free Inquiry Card on page 77)



This 2x10 plank landed end-first among several workmen, toppled over and hit Wilson Nesbitt (inset upper left). The brim of Mr. Nesbitt's hard hat took the impact saving his face from injury.

TWO HITS TO HATS...

But no hurt heads!

IT DOESN'T make any difference whether you're a supervisor or a worker—you still need a hard hat around construction work. Falling objects make no distinction between heads. Ray E. Dauber, job superintendent for the Eichleay Corporation, and Wilson Nesbitt, a boilermaker for the Pittsburgh firm, can testify to it.

Mr. Nesbitt was standing with a group of other workmen when a 2 x 10 piece of lumber 10 feet long plummeted end-first between them. He isn't sure how far it fell—it could have been as much as 35 feet. The plank toppled over and struck the brim of the plastic hard hat Mr. Nesbitt was wearing.

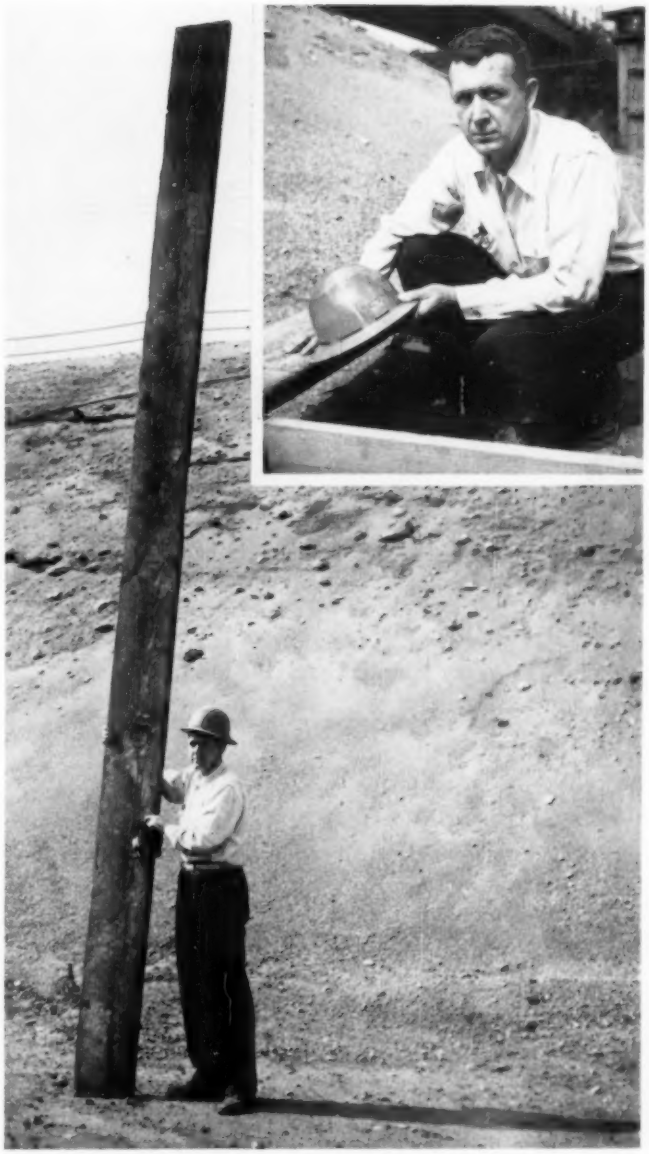
"If I hadn't been wearing the safety hat," said Mr. Nesbitt, "I hate to think of what my nose would have looked like. As it was, the jar broke a bridge in my tooth."

Just two days after Mr. Dauber had congratulated Mr. Nesbitt for having the good sense to wear his hard hat, the superintendent was inspecting an area 20 feet below the base of a high smokestack.

The end of a 2 x 12 plank 16 feet long slipped from its supporting angle in a scaffold above and plunged 20 feet toward Mr. Dauber. He was just starting to look up when it struck his safety hat. The impact split his hat from crown to brim but it was the hat that took the beating.

He was given treatment at a nearby first aid room of the prime contractor for the power plant construction project. Then he reported back on the job.

Pictures by courtesy of Mine Safety Appliances Co.



Ray E. Dauber (inset upper right), job superintendent for a construction firm, holds the plastic hard hat that saved him from a serious injury when a 2 x 12 plank fell 20 feet and struck him.

A MIDWEST manufacturer of gears, shafts, and differentials, has been keeping cost records of factory maintenance expense. In 1950, fluorescent industrial troughers were removed from their suspended position and replaced with a clean unit. The soiled fixtures were placed on a dolly and transported to a central location where they were washed, completing the cycle. These fixtures were the removable type, placed at a 9-foot mounting height. Cost figures, based on washing 614 fixtures 3 times per year, showed an expense of approximately $2.13 per cleaning. This developed an annual cost for cleaning and maintaining the 614 units of approximately 3,923 dollars.

In the new plant, the company is maintaining 2,154 industrial troughers, located at a 16-foot mounting height, placed end to end. The company realized that increasing the number of lighting fixtures from 614 to 2,154 units would increase the annual maintenance cost, based on the above figures, by at least 9,850 dollars per year. It was obvious that the increased cost would be considerably greater than this because the new units were the fixed type and were mounted at a 16-foot height.

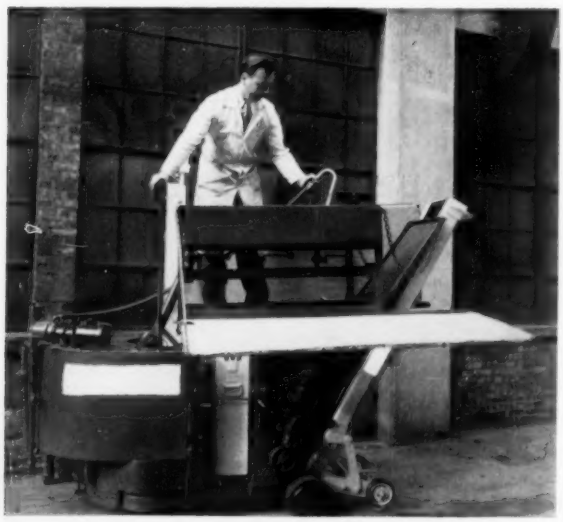
Lighting Maintenance Truck

After observing a high-lift maintenance truck in action the company decided that this unit, through labor saved, would pay for itself within a short period of time. This reasoning was based on using the truck on washing and group replacement lighting maintenance only, without consideration given to many other labor saving uses for this equipment. The truck manufacturer stated that the company should average in the neighborhood of 10 lights per hour, using this truck with one operator. Therefore, it was planned to allow 6 to 8 weeks for the cleaning and group replacement of the 2,154 units.

In actual practice, it was possible to service an average of 15 lights per hour, enabling the job to be completed in two months' instead of one month's time. Obviously, it is now economically feasible to maintain lighting intensity at a much higher value than in the past, and at a drastically reduced cost per fixture.

The company reports many indirect benefits:

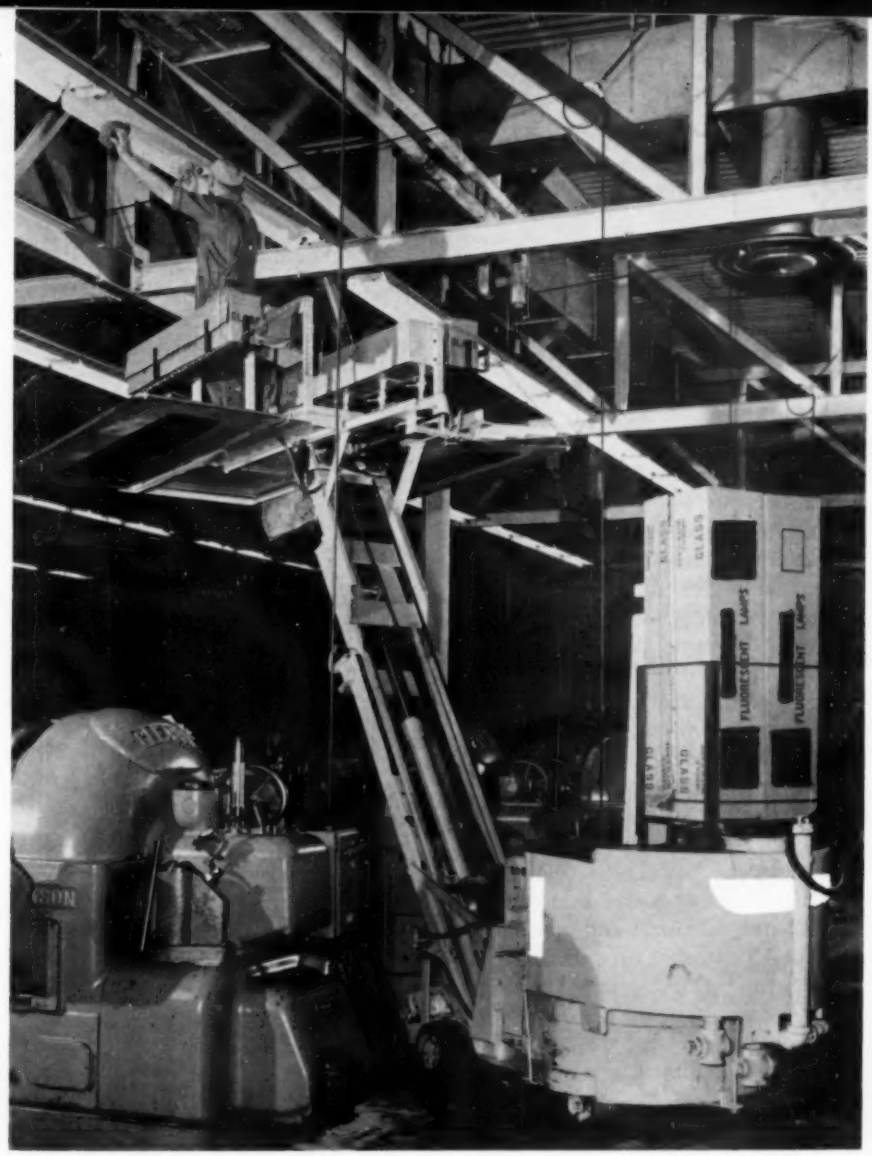
1. Workmen are well pleased with the increased lighting intensity.
2. Decrease in eye strain and fatigue has been noticed by many workmen doing their day's work.
3. The usual oily, dirty haze, seen throughout the factory under soiled fluorescent lights, has now disappeared underneath the lights which have been cleaned.
4. The convenience of having to disturb the factory workman at only one time when group replacing, washing, and checking is done in one operation.
5. All fixture servicing can be held at a minimum by checking the starter and ballast troubles when the fixtures are cleaned and group replaced.
6. Increase in lighting with no increase in electrical energy consumption.
7. Space required for stock piling of lamps can be kept at a minimum under the group replacement plan.
8. A more intelligent light meter survey can be made to control a lighting program.



LIGHTING M

The direct benefits are listed below:

1. The maintenance truck has been so designed that the operator may move into position, raise to working height, remove lamps, wash fixtures, replace



With the lift-truck at right plant maintenance has equipment which permits lighting maintenance work to be carried on without disturbing plant production. Of course, it also enables one man to work many times as efficiently.

Photo at left shows how difficult-to-reach areas become easily accessible to worker. Equipment is close at hand and flip-down canvas sides prevent any parts or tools from falling on persons at work below.

Telescoped lift can be extended to reach work 20 feet above floor. Operating on its own power, it can carry water for full-day's cleaning. It can also be used for other overhead maintenance work.

By M. E. MITCHELL
General Manager
Mitchell Maintenance Co., Inc.
Muncie, Indiana

FEATURE

Third article of a series on Lighting Maintenance. First two articles appeared in the January and February issues.

AINTENANCE GETS A LIFT!

lights, and return to floor position with a minimum amount of time and effort. An operator may work without moving from a standing position, without bending his back, or in any way develop a working position that creates fatigue.

2. The company finds that an operator is able to reach 95 percent of all fixtures in the factory with the lift truck. The additional 5 percent of fixtures are reached with window ladders and a sliding board.

Additional Maintenance Uses

The company plans to use the maintenance lift truck approximately 3 times a year for the washing of fluorescent fixtures. In addition, the equipment will be used in the periodic cleaning of building girders to minimize the danger of flash fires. At other times when the equipment is available, it will be used in window washing and other maintenance work. In order to obtain a higher working height for the operator, an additional aluminum platform will be used to elevate the operator approximately 8 feet above the regular 20-foot working height of the truck's platform.

This equipment can be kept busy on these duties throughout the year on one 8-hour shift. It will also be used on the other two shifts for general purpose work, such as removing and cleaning ventilating systems, opening and closing overhead valves, the installation of additional electrical outlets, motors, fluorescent fixtures,

(Continued on page 66)

By EVERETT W. MARTIN—Editor
Connecticut Journal of Industrial Safety
New Haven, Conn.

The Safety Engineer's "Occupational

ALL OCCUPATIONS seem to develop patterns of behavior, characteristic outlooks on life, and specific effects upon the human being. Safety Engineers are no exception. They are a peculiar breed.

First, as the step-children of the Engineering professions, they suffer from a feeling of inferiority. Their friends in college who were put through the same curriculum are now building bridges or roads, creating new machines, or developing new chemical processes. They, poor devils, are creating or developing nothing. As a matter of fact when they are most successful, nothing happens, no accidents occur, and management begins to wonder whether or not they could do without a Safety Engineer and save the expense. Time after time the safety movement has lost able men because the fields are greener over the fence in management. Many feel there is no fulfillment in safety.

This lack of creative effort in the work of accident prevention leads to two interesting results: 1. Safety men tend to concentrate on the physical aspects of prevention, the making of guards, emphasis on the pure engineering approach, in order that some tangible effect can be observed. 2. They shy away from such things as education for safe practice, and any attempts to establish consciousness of safety because, after all, you can't write much of a report on such things, and if you could, management might not be interested anyway. Another result shows up in safety engineers' hobbies. Nine out of 10 safety engineers are always building something on the side; hen house, boats, furniture, gadgets, toys, anything to satisfy the urge to build that isn't satisfied by a lowering frequency rate and a pretty chart, or clean aisles or a dustless atmosphere.

Doctors often are said to suffer from a disease which is their specialty. In this respect, the Safety Engineer is like a doctor. He is often overly cautious, far too much so in his personal life and many times in his business life. He pussyfoots too much, appeases too much, is regimented easily, and takes the safe way. Safety Engineers forget that there are no completely safe ways and that against the great variety of human cussedness and truculence there are few guards that can be built. They are also a frustrated lot. They cannot reconcile their efforts to save a few lives with the cheapness of human life seen around them in the world. They seem to be fighting a four-alarm fire with a water pistol.

Thus inferiority, lack of creative outlook, a sublimation in hobbies, over-caution and frustration due to the times characterize the occupational disease of safety engineers.

The Disease's Cure

Most safety engineers are at different times subject to a feeling of inferiority. They are told that they are not engineers at all. Some claim that their standards are not sufficiently high to warrant professional registration. Still others feel that if the job is being done properly in a plant there is little need for safety engineers. Some even maintain that in a relatively short number of years there will be no such occupation as a safety engineer.

The truth is that there is no occupation which requires the breadth of knowledge, the requirement of active participation and persuasion, a meticulous attention to detail and a broad dilation of the mind, more than safety engineering. The professions deal with the frailties of human beings. Physicians deal with their physical insecurity, lawyers with their propensity to quarrel, for example. Why then cannot safety engineering deal with the frailty of people in their propensity to accidents? There is no reason for inferiority. It can be cured by a broader outlook, a careful attention to the study of safety problems, a mingling with the other professions, and a faith in the work which the Safety Engineer is doing.

The cure of the next two symptoms—lack of a creative outlook and a sublimation in hobbies—lies in an analysis of the creative work of all Safety Engineers. They can express themselves creatively in but three ways. They can speak. They can write. They can be creative with their hands. The development of these 3 methods of expression to the utmost in relationship to work, in relationship to activities outside

work, and in development as individuals are the answers to lack of creativity and sublimation.

The over-caution, which can be seen in many instances in the actions of safety engineers, can best be overcome by a clear understanding of just what safety and security means. We do many things of a cautious nature which are correctly done. If we are cautious in a plant, on the highway, or in the home, along the lines that safety engineers preach, we do so that we may be free to engage in that adventure of life which is so necessary for progress. Life is not all safety. Whether we are safety engineers or engaged in other occupations, we cannot avoid risk taking, nor should we. Our job is to understand relative values, and govern ourselves accordingly. Last in this list of symptoms to be considered and perhaps corrected is frustration—a very common complaint. We are frustrated by recent exhibitions of man's inhumanity to man. We are calloused; we are cynical; we are, at times, provoked and revengeful. Of such is frustration.

The answer is work, work in the many fields open to an individual. To be interested in a job alone is not enough in our society which we label "democracy." Each man must be engaged in that work of personal development which is all too often neglected after the receipt of a degree. There is seldom frustration where a man is taking part in those activities in which he rightly should be engaged.

The basic objective of the Safety Engineer, as in all worthwhile endeavor, is to accentuate the worth, the value and the dignity of the individual man and woman. There is too often a failure to see the fundamental work in which Safety Engineers are all engaged. They should never apologize for this work. They should constantly strive to make others see the necessity of the values which underlie it. By so doing, they can influence the thinking and outlook of others to give them a better appreciation of the worth of Safety Engineers.

The Basic Creed

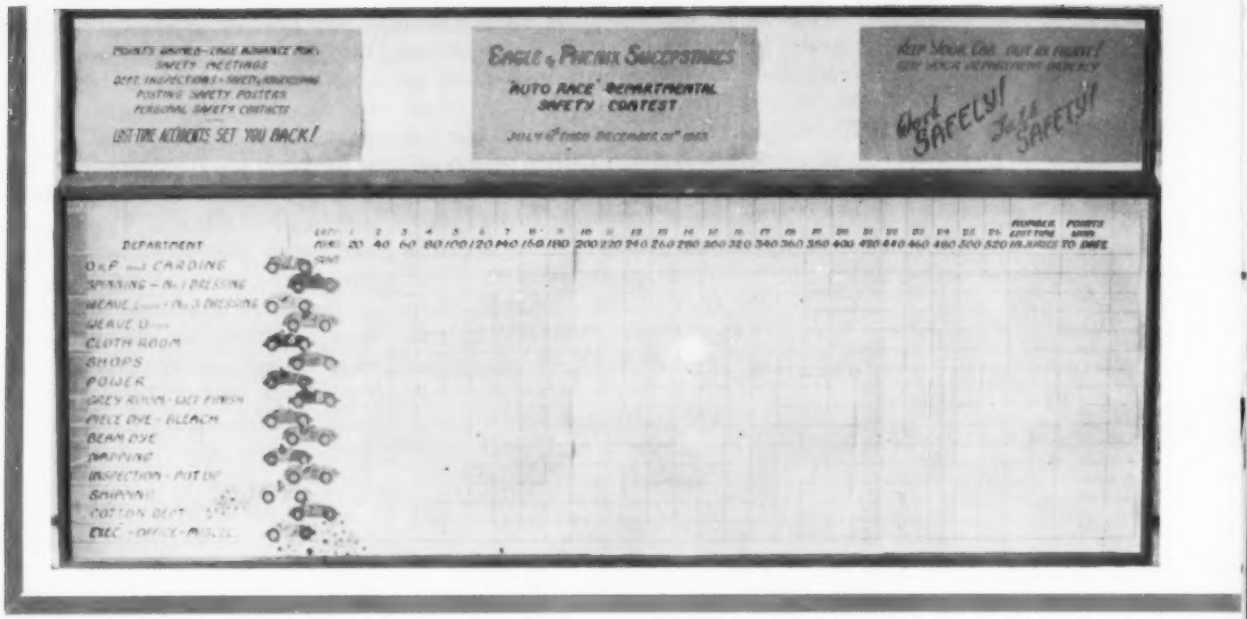
Some years ago the writer composed a code of ethics for safety engineers. Here is what he feels should be the outlook of Safety Engineers.

1. I will apply myself diligently to the study of my work, that my judgments may be correct and my actions based on a broad knowledge of physical facts and of people.
2. I will share my knowledge with others for the benefit of all.
3. I will be humble in what knowledge I possess, realizing that in even one of the varieties of human experiences, no man can be all wise.
4. I will endeavor to create respect for my profession by personally conducting myself as an individual worthy of respect.
5. I will try earnestly to interest others in the work of accident prevention in order that many may act in the future where few have acted in the past.
6. I will write, speak, and instruct, to the best of my ability, in the field of my choice so that my influence may be exercised more effectively.
7. I will show a deep regard for the value of the individual and despise no man's opinion.
8. I will fight thoughtlessness, callousness, and cant.

And may these serious pursuits be tempered by a sense of humor and the catalyst of common sense.

Disease"...

ITS CAUSE AND CURE



By FORREST K. VAN HORN

THE market for ideas is a buyer's market in which, very often, the buyer must *sell himself* on the value of some plan and its application to his problems. This may account in some measure for the fact that we very often tend to discard accident prevention ideas without even trying them out. This seems especially true when some special effort is required to implement the plan. Then again, failure to use an idea may be the result of hesitation to spend tangible dollars for what appear to be vague returns. But what happens when we use any and every idea that seems to have the faintest relation to our problems? How much success can we achieve if we couple this attitude with an imagination that gets the full potential out of each idea?

The recent experience of a large cotton mill in Columbus, Ga. supplys one answer to these questions. When the Eagle & Phenix Division of the Fairforest Company became a member of Reeves Brothers Inc. it was noted that a substantial number of accidents were being reported. Initial steps were taken to introduce this unit to the Reeves Brothers safety program, but when the next year showed an increase in accidents and lost time cases despite improvements in the efficiency and safety of production operations, a special study of the problem became necessary.

A thorough analysis of losses and other available information to determine the exact situation were laid before management, who quickly arranged a meeting with the engineers of the insurance management firm and the insurance company. The ideas used were those which had been tried and proven elsewhere. It must be emphasized, however, that the imaginative application of these ideas contributed greatly to the success of the effort, since the greatest problem was to determine *how* to get the cooperation of all personnel.

Following the initial conference, a careful inspection of the mill was made, to determine the extent to which physical hazards were influencing the situation. This was followed by an analysis of past accidents, to pin-point the problems of physical hazards and unsafe acts down to the individual machine or person, the information being listed for future use.

The next step was to call a meeting of all supervisory personnel, to discuss what had been developed up to that point. Ideas advanced at this session were incorporated with the other information for final study. Everyone stressed the importance of "selling" the program to the individual. The final conference then correlated all information into a plan which became an inter-departmental "Safety Sweepstakes," in which each department was represented by a differently colored racing car. Approval of management and the Safety Committee having been secured, the program was put into effect on July 1, 1953, preceded by several announcements posted on the bulletin boards. These announcements were designed to stimulate interest in the program and attempted to intrigue all concerned by use of the "pit language" familiar to auto racers.

As originally planned, a total of 520 points could be earned by each department in a 26 week period, for performing certain functions pertinent to the contest. Among other items, the schedule of points allowed a credit of 4 points per week for "safety items," such as, proper guarding; 8 points per month for holding departmental safety meetings, 2 points per week for properly

Plant departments,

represented by racing cars in chart at left,

begin race against accidents . . .

and no matter who comes in first . . .

The Winner Is . . . Safety!

posting safety posters and removing old ones, and 8 points per week for making personal safety contacts with all personnel in a department. Because coke bottles had been placed on convenient window ledges and other places instead of in the receptacles provided, and because bobbins were often found on the floors, special points were awarded for "housekeeping" items such as these. To furnish the incentive to gain points for compliance with the various features of the program, failure to perform these necessary steps resulted in a deduction of the same number of points. One point was even deducted if 5 coke bottles or bobbins were found misplaced, which tended to dramatize this problem.

Two separate inspection committees composed of members of the Safety Committee made these evaluation inspections, and regular departmental inspections were continued as well. Records and reports were required where necessary, but an effort was made to keep this paper work at a minimum so that important functions of the program were not impaired by time used for record keeping.

An early change in the scoring system eliminated the award points for not having a lost time injury, since it was felt that the mill was not striving for a record, but for actual elimination of accidents. As the contest progressed, the need to award "bonus points," or "lap prizes," as they were called, became apparent, to stimulate interest of those departments which were falling behind. A poster contest was conducted among the employees, with first to fifth place winners sharing the prize money, and the first 10 posters being awarded "bonus points" which were added to the departmental score.

Housekeeping was encouraged by little stunts such as placing a dollar bill inside a bobbin and throwing it on the floor. This was announced on the bulletin board and further stimulated the housekeeping program. As a matter of fact during the last inspection visit to Columbus, not a single bobbin was found on the floor, and coke bottles were all in the racks provided. Several departments had even made signs advising workers to pick up bobbins or coke bottles and properly dispose of them as "they are costing us points."

To arouse interest, certificates of appreciation were given to 35 employees who had worked from 25 to 56 years without a lost time accident, the total years of their service amounting to 1122 years! The certificates were presented at a steak dinner to which an outside speaker had been invited to tell of the experience at his mill. Use of outside speakers, incidently, was exploited to the fullest measure, with inspirational talks being intermingled with concrete examples of what other mills were doing.

All types of publicity were sought. The local newspaper faithfully reported progress of the contest and other items of interest; an item appeared in the Southern Textile News; and an outline of the contest was broadcast to its members by the Cotton Manufacturers Association of Georgia. It was also briefly outlined at the recent South Carolina Safety Conference. All this publicity brought a number of inquiries from various sources for additional information. Letters of encouragement were written for posting on the bulletin boards by members of management, superintendents of other mills in the group, the insurance carrier, insurance management firm, and others. Another idea suggested was to arrange a display of model racing cars and photographs of serious automobile accidents, the

latter coming from the local newspaper. While primarily designed as an industrial safety program, the "undertones" of the "musical score" of this sweepsakes were the subjects of automobile and home safety.

While it may be too early to evaluate the success of this program, it should be noted that prior to July 1st lost-time accidents were numerous and out of proportion to the total accident volume. With the exception of two "time charge" accidents which occurred in the first two weeks of the contest, not a single lost-time case nor serious injury requiring time charges has been reported since. Accident volume has been steadily whittled down until not a single accident was reported to the insurance carrier in the month of November. The mill's 1400 employees have long since passed a million man-hours of operation free of lost-time accidents.

Programs Save Dollars

Since the idea of an inter-departmental contest is not new, we can turn to the experience of another firm which has used this type of contest since 1946, to evaluate monetary results. Sufficient time has not yet elapsed for such evluation of the mill's experience. In this other group, all but one plant was working under the handicap of a debit experience in 1946. Compensation insurance was costing 7500 dollars per year more than the premium possible under manual rates. Following adoption of the point system safety contest, 1947 found one plant with a credit experience, two operating at manual rates, with the rest running a debit experience. Nineteen hundred forty-eight still found two plants debit rated, but in 1949 every plant shared in a credit of 56.5 percent. The dollar savings in the 5 years beginning with 1949 are impressive. The savings in insurance premiums alone amounted to 117,856 thousand dollars which does not take into account the savings that result from a lack of interference with production, replacement of injured personnel, and other savings.

Getting back to the cotton mill, it should be noted that "gimmicks" were successful only because of persistent effort, unbounded enthusiasm, and the vivid imagination of management at Eagle & Phenix. Is full exploration of an idea worth while? There are those who have had association with this particular contest who answer most emphatically, "YES!"

What's ahead for this mill? A new contest, to be called "Let's Ring The Bell For Safety," built around the key phrase, "To the FOUR FREEDOMS symbolized by the Liberty Bell we now add FREEDOM FROM INJURY." An old mill bell which had been used in the past to call workers to their jobs is to be rung once a week on each shift if no lost-time injuries are reported. Another program in the making will involve an Indian theme to be called "Stampede For Safety," and a "fishing contest" is planned in which each department will be represented by a fisherman, from whose hook will dangle an increasingly larger fish as points are earned. It has also been suggested that this be followed by a real fish fry, Southern style!

Picture by courtesy of Eagle & Phenix Division of Reeves Brothers, Inc.

At the Maintenance Show . . .

Every foot of space in the huge International Amphitheatre of Chicago's famed stockyards bulged with exhibits of firms representing America's "blue chip" companies who displayed devices, equipment and products designed to make industrial operation safer, cheaper and more efficient.

Mechanical lifters, cranes and vertical platforms moved up to the rafters to show ease of operation; dust and fume removal systems sucked away hazardous dirt and vapors; floor cleaning equipment scrubbed and dried floors in a flash that would have turned every housewife green with envy. Metal objects were whisked away by magnetic action and everywhere the theme repeated the refrain that good plant maintenance is another name for safety and efficiency.

Skin protection and washroom sanitation pinpointed emphasis on industrial health conservation as an aid to production. Products designed to reduce illness, infection and absenteeism were shown to the thousands of operating officials who explored every avenue leading to cost reduction.

New types of luminous, plastic and adhesive-backed warning signs spread the message of accident prevention and fire control.

Many large plants sent large delegations of workmen and supervisors to the night opening of the exhibit so that the man on the bench, as well as his chief, could view the results of American know-how. In addition, visitors from the western countries of Europe were shown our latest advances in an economy founded upon peace-time operaton.

Maintenance Conference

(Continued from page 13)

system, analysis of high job costs, and a channel for management and employee communication. Mr. Meyers suggested that a maintenance budget provide for a schedule of expenditures, level of activity of the department, and for routine and extraordinary repairs, as well as projects of a capital nature. He offered techniques for budget planning such as long-range planning for "period" costs, an evaluation of deferrable and immediate maintenance, and an estimate for labor, material, and burden costs.

Cost control and budgeting for plants with 2300 employees and 650 employees were presented by two other speakers. Theodore J. Hazelton, maintenance supervisor, Monsanto Chemical Co., discussed the larger plant's problems explaining that justified maintenance expense in his company improves safety, improves product quality, improves product yield, improves product cost, or falls within the repair ex-

(Continued on page 28)

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(For full details, use Key # P-14 on free Inquiry Card on page 77)

Maintenance Conference

(Continued from page 26)

pense budget. He added that a job that gets out of control usually does so because of inaccuracies in time-keeping, lack of background facts before a job is estimated, a lack of knowledge of job costs, or inefficient use of manpower. J. A. Openshaw, plant engineer, Stanley Home Products, Inc., explained the cost control system for maintenance work in his plant. Keeping it simple for small plants was the central theme of Mr. Openshaw's discussion. He said his own plant has set up the number of man-hours for power plant, security, custodial work, preventive maintenance, repairmen, electricians, pipe fitters, carpenters, and lubricators; and, with sensible supervision, this informal rather than rigid budget system has worked well.

Planning and scheduling maintenance work was discussed in general terms by George J. Martin, manager, mechanical division, production department, National Biscuit Co., in a plant of 1100 shop employees by F. R. Malmgren, building superintendent, A. B. Dick Co., and in a plant of 150 shop employees by Clark A. Ralph, plant engineer, Wales-Strippit Corp.

Maintenance Planning

Mr. Martin told the conference that planning and scheduling in plants with more than 100 maintenance employees should be done by specific personnel whose sole function is to do this kind of work. The results will pay off, he said, in the least amount of interference with production, the greatest economy of man-hours and the lowest expenses.

Mr. Malmgren pointed out that maintenance planning in his plant involves a manual to set up standards and procedures and consultation before construction of a new plant area to make it a simple maintenance problem. Mr. Ralph explained that his corporation based its planning and scheduling on two items basically: the orders for a work to done, and a planning chart. Properly used, these tools make possible a very efficient and smooth-running maintenance program, he said.

Organizing people as well as policies and procedures for effective maintenance was the subject of a talk by Stuart Whitehead, general superintendent, maintenance and construction department, Calco Chemical division, American Cyanamid Co. Mr. Whitehead offered 8 points for self-improvement in maintenance: examine the type of program a plant needs factually and relocate supervision and hourly employees where necessary; determine what work should be done and when; measure accurately the productivity of employees and their non-productive hours; check order flow, planning and scheduling, and do not overload supervision with clerical work; check to determine that proper material is on hand in sufficient quantity, that it does not deteriorate in storage, and that a proper salvage operation is conducted; institute or improve an active preventive maintenance program; select and train hourly and salary employees; maintain and develop good morale.

Maintenance Training

In an address on training persons for maintenance work, David W. Hill, training supervisor, Hercules Powder Co., Inc., suggested these steps: a full interview and selection program tied to a testing program, an age limit, on-the-job training, a careful step-by-step job advancement from the simplest to the most difficult, textbooks and class courses, if possible, and a constant evaluation of the training program.

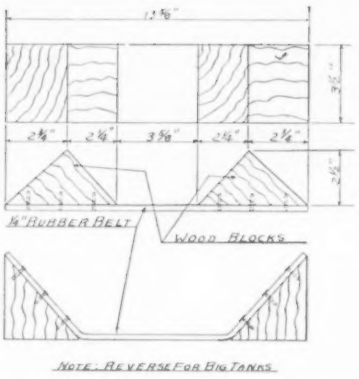
"SAFETY MAINTENANCE" Salutes a Safety Idea

Simple Gadget Controls Roll of Gas Cylinders

A SIMPLE but effective safety block for oxygen, acetylene and similar tanks has been developed by the Columbia Cement Division of Pittsburgh Plate Glass Company.

Developed jointly by labor foreman W. E. Rucker and truck driver Carl Coble, the device is described by R. J. Hearing, safety and welfare director at the East Fultonham, Ohio, plant, as an extremely effective gadget for controlling gas cylinders being transported by truck.

The block is made by nailing two triangular wooden blocks 2½" high by 3½" wide on a piece of rubber belting 3½" wide and 15⅝" long. When the belting is on the bottom, it fits a standard size tank. By turning the belt over, it automatically adjusts itself to fit larger size tanks. It is believed that this idea has possible applications other than those for transportation of gas cylinders.



Work measurement, work standards and incentives were examined by W. C. Cooling, manager, methods and standards department, International Resistance Co. Mr. Cooling proposed a definite, clear-cut organization of maintenance, job evaluation and job description, incentive data based on method used in performing the task, estimating maintenance efficiency under operating conditions, and continuous review as well as continuous planning of the maintenance work schedule, as answers to problems in this field. The problems of handling maintenance labor, according to E. G. Balzano, plant engineer, Sieberling Rubber Co., center around different types of unions, incentives, apprentices, seniority, promotions, shifts, absenteeism, and overtime allocation. Mr. Balzano said the way to attack the problems was for both management and labor to work together on them.

Area maintenance was compared with centralized maintenance by J. B. Gibbons, plant engineer, aircraft gas turbine division, General Electric Co. Mr. Gibbons used his own plant as an example of the organization with numerous autonomous departments which must be given the necessary services to complete a production job. In such a case, he continued, a system combining both area maintenance (maintenance of a certain area by a group of specialists) and centralized maintenance (a generalized department which covers the whole plant) works out best. The pros and cons of preventive maintenance seemed to O. W. Gravely, works engineer, Electro Metallurgical Co. division, Union Carbide & Carbon Corp., to also offer a chance for compromise of the two methods. Mr. Gravely said that where experience showed that certain emergency repairs did not reduce production or increase overall costs of maintaining equipment, these repairs could be best handled as actual need demanded. Simplicity argued for this method. On the other hand, he said, preventive maintenance, if

(Continued on page 30)

Large sign at refinery is changed at least twice a week, and prizes are given employees for the best safety slogans submitted for it.

Signs of the type shown here have changeable letters and are used for weather reports and announcements as well as in promoting plant safety.

OUTDOOR Safety Signs Attract Attention

SAFETY messages with an impact that can be seen and read by all employees are now being used by many large industrial plants who have outdoor sign board installations placed near entrance gates or overlooking parking areas. Easily changed, the signs can warn of expected weather hazards and show temperature readings so that workers can prepare against icy roads or slippery highways, in addition to carrying safety slogans.

This type of sign is being used effectively by a Sinclair Refining Company Plant. The sign is 62 inches high by 10 feet long with 4 rows of 8-inch red and green plastic letters. In this case the sign is changed at least twice a week and the interest of employees is encouraged by prizes donated by management for slogans submitted.

The new giant safety sign is built on the principle of the outdoor theatre marquee and is designed to attract maximum attention. For example, an outdoor board is used by the Tulsa Plant of the Mid Continent Petroleum Corporation and is situated where it can be seen by everyone entering or leaving the plant. Manufacturing plants with large parking areas use a changeable sign board by alternating safety messages with weather reports and other information. At the Hoosier Unit of the Indiana Arsenal the Green Cross maintains a large changeable sign that cautions employees to "Stay Alert and Don't Get Hurt."

At the Melrose Park Works of the International Harvester Company, the signs have proved so effective that the company has now placed an outdoor sign board at each one of its 4 entrances. The signs are 48 inches high and 15 feet long with 3 rows of 8-inch plastic lettering. These boards are changed at least twice a week, and, in addition to carrying safety messages, show information of interest to employees and promote worthy civic enterprises and plant activities.

Several of these large outdoor signs were shown at the National Safety Congress when it met last fall in Chicago. The messages on these signs were kept up-to-date and enabled delegates to the Convention to know what was going on and where. They attracted considerable attention.

(Interested readers are invited to write to the editor of SAFETY MAINTENANCE & PRODUCTION for information on obtaining these signs.)

Pictures by courtesy of Wagner Sign Service, Inc.

Maintenance Conference

(Continued from page 29)

properly controlled, can in many instances cut costs and up production.

Corrosion Control

Plastic, rubber-lining, and protective coatings as protection and substitution for metals against corrosive conditions were discussed by L. R. Honnaker, supervisor, engineering consultants, engineering department, E. I. DuPont de Nemours & Co. He suggested that new advances in these materials made their use advisable under certain corrosive conditions. He also outlined the various types of corrosion in metals likely to be encountered and the protective steps to be taken to combat them.

Maintenance in hospitals, medical departments, and first aid rooms was the topic of I. J. Shyne, administrative assistant, Jewish Hospital, St. Louis, Mo. Mr. Shyne stressed that safety was of prime importance in hospital maintenance and that this objective increased the scope of hospital maintenance until it covered everything that went on in the hospital. He listed care of the building, fire and communications systems, all sterilizing and many other types of equipment, as well as laundry and food sanitation. A hospital, he concluded, must, by its nature, have a preventive maintenance plan.

Sanitation Problems

The place of sanitation in plant maintenance was the subject of a panel which included J. Lloyd Barron, sanitary engineer, National Biscuit Co., B. L. Murray, plant sanitation supervisor, Carbide & Carbon Chemicals division, Union Carbide & Carbon Corp., Glen L. Doty, superintendent, sanitation department, United States Rubber Co., and V. J. Del Giudice, section head, technical service section, Union Stock Yards, Armour & Co.

Mr. Barron pointed out that the nature of sanitary maintenance required that it be separate and not grouped under mechanical maintenance. Control of the working environment, he went on, is the function of sanitary maintenance and includes sanitation of the product when necessary, floor cleaning, waste disposal, painting of walls, ceilings and facilities, maintenance of personnel accommodations, guarding the premises, protecting perishable or sensitive materials, and controlling insect and rodent infestation.

Mr. Murray outlined the operation of such a sanitation program in his plant. The sanitarian surveys the plant for quality of sanitation level, issues a good housekeeping manual to supervisory personnel, controls outside sanitation, works with the purchasing department for sanitation supplies and equipment, and checks and sets up standards for insect and rodent control, refuse disposal, water supply, and food service. The cleaning personnel under him work in crews to clean and overcome the sanitation problems he points out and details methods for combatting.

Mr. Doty described how housekeeping committees, technical knowledge of the materials and possible diseases from handling them, men whose specific job is machine cleaning, and continual follow-ups have helped his plant keep a very high sanitation level. While he felt that housekeeping and sanitation go hand in hand, Mr. Doty explained that they were as different as "night and day," and should be made the responsibilities of separate departments.

Mr. Giudice proposed that effective sanitation requires booklets of specific instructions on sanitary maintenance, surveys and inspections, statistical quality control applied to production lines, posters and suggestion boxes, incentive rates for maintenance jobs, and establishment of sanitation committees at local level. Poor sanitation, he added, increases costs because of lower quality products, spoilage of product, customer lawsuits, improper use of sanitation tools and

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waste, poor public relations, and poor interdepartmental relations.

The cost of sanitation is too high in many plants, according to Mohe H. Solworth, president, Industrial Sanitation Counselors. With the rise in cost of labor, Mr. Solworth continued, management is coming to look on sanitation as a tax paid to dirt. Antiquated methods, old-fashioned procedures, and indifference have made sanitation inefficient. He declared that new machines, new methods, time lists, work load determination, rating forms for product and personnel, as well as correction memos and daily check lists should be increasingly used.

Disposal, Pest Control, and Dermatitis Problems

Pointing to new and more strongly enforced laws now being aimed at pollution caused by industrial waste, T. J. Powers, supervisor, waste disposal department, Dow Chemical Co., declared that industry must control its wastes before it is forced to by outside agencies. Solid wastes, Mr. Powers said, are being disposed of chiefly by burning and land-fill methods. Air pollution problems, he continued, are being attacked by catalytic burning, absorption, precipitation, separation, filtering, scrubbing, and direct burning. Waterborne wastes are causing alarm in many places, he added, and the simplest way to attack the problem is not to throw it away too fast. While treating waste helps, the most important single check to pollution problems is to cut down on waste, he concluded.

Making it clear that rodent and insect damage is a matter of "control" and not "extermination," Sidney Brierley, assistant department head, inside cleaning, Eastman Kodak Co., explained that the keys to control of these pests are a thorough knowledge of their habits, rodenticides, and insecticides, a planned program based on a careful survey of the plant and surrounding areas as well as a knowledge of plant processes, a careful and continued application of the exterminating agents, and a prevention program in conjunction with a correction program. Mr. Brierley suggested the use of both newly developed controls and some which have been in existence for a long time.

Occupational dermatitis is caused both by actual mechanical, physical and chemical substances and processes and by predisposed conditions of the skin, Dr. Louis Schwartz, M.D. told the conference. Dr. Schwartz said that control of occupational dermatoses involved such things as protective clothing, washing facilities, skin cleansers and protective ointments. The yearly loss from occupational dermatoses he estimated at more than one hundred million dollars.

Pictures by courtesy of The Aviation Corp. (top), Labelon Tape Co. (second from top), General Electric Co. (third from top), New York Central System (bottom).

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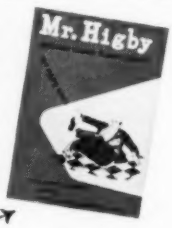

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INSIDE THE TRADE

NEMA Elects New President

VICE president, J. H. Jewell, of Westinghouse Electric Corporation, Pittsburgh, Pa., has been elected president of the National Electrical Manufacturers Association. Vice presidents named by delegates are: J. L. Busey, vice president, General Electric Company, New York, N. Y.; J. W. Corey, president, The Reliance Electric & Engineering Company, Cleveland 10, Ohio; W. A. Elliott, president, Elliott Company, Jeannette, Pa.; F. F. Loock, president, Allen-Bradley Company, Milwaukee 4, Wisc.; Hoyt Post Steele, executive vice president, Benjamin Electric Mfg. Company, Des Plains, Ill.; re-elected as treasurer is A. F. Metz, president, The Okonite Company, Passaic, N. J.

New Ampco Distributor Announced

AMPCO Metal, Inc., Milwaukee, Wisconsin announces the appointment of the Allan P. James Company, 430 Ninth Street, San Francisco 3, California as a distributor of Ampco grade 18 centrifugally cast bars and Ampco grade 15 extruded rod. The safety tool division of the company has just appointed Persingers, Inc., 520 Elizabeth Street, Charleston, West Virginia as a class A safety tool distributor for the West Virginia area.

Zane Weldcraft Supplies located at 171 Wethersfield Avenue, Hartford, Connecticut has been appointed as the exclusive distributor for the full line of Trode and Phos-Trode products for the Hartford sales area.

Kirk-Wiklund & Company located at 1700–06 Baltimore Street, Kansas City, Missouri has recently been appointed to distribute the entire line of the company's weldrod products in the Kansas City sales area comprising the eastern and northern counties of the State of Kansas.

Kidde Opens New Toronto Office

A NEW office has been opened by Walter Kidde & Company of Canada Ltd. at 360 Old Weston Road, Toronto. The office will handle the company's full line of built-in carbon dioxide fire extinguishing systems, smoke detection equipment, and portable units. It will service the Province of Ontario.

Hewson Company Appoints Representative

THE Hewson Company, Inc. announces the appointment of Harris-Hanson Company, 5506 South Kingshighway, St. Louis 9, Missouri, as representative for sales, field application and servicing of its line of Takk High Voltage D. C. Insulation Test Sets and High Voltage Power Supplies, Takk High Speed Static Control Systems and Staticator Master Static Alarm Systems, for Southern Illinois, Missouri and Eastern Kansas.

Libby-Owens Ford Opens New District Office

PROJECT engineer James E. Baskin, on the technical staff of the Fiber Glass Division of Libby-Owens-Ford Glass Company at Parkersburg, W. Va., has been named district sales manager of a new office to be established at Cincinnati. The announcement by C. F. Hegg, general sales manager of the LOF Fiber Glass Division, indicated that

the Cincinnati office will be with the company's other sales quarters at 912 Enquirer building. Mr. Baskin has had more than 15 years' experience in the fiber glass business with broad background of work in factory and technical side of product development.

New Manager for Fireye Office

COMBUSTION Control Corporation, Boston, Mass., manufacturers of Fireye Flame Failure Safeguards, announces the appointment of Mr. Arne Lovendahl as manager of its Philadelphia area office. Mr. Lovendahl is a graduate of Northwestern University School of Mechanical Engineering. For the past two years, he has been with the company as Sales Engineer in the Chicago area.

Bausch & Lomb Appoints

THE promotion of George H. Phreaner to sales manager of Bausch & Lomb Optical Company's ophthalmic division is announced by Carl S. Hallauer, Executive Vice-President. Mr. Phreaner succeeds Ben A. Ramaker in the direction of all sales and distribution of the company's ophthalmic products.

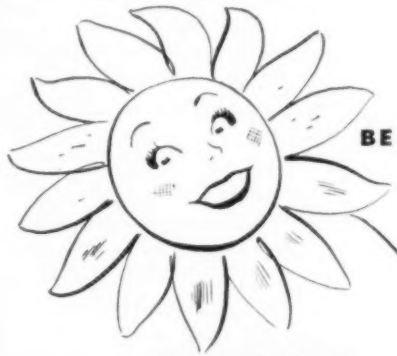
He joined the company's factory production staff in 1937 upon graduating from Amherst College. After serving as a factory representative and salesman in the Chicago area, he returned to Rochester in 1942 as an aide in the company's war production program. Three years later he rejoined the ophthalmic division, serving as a sales representative in the Minneapolis and Philadelphia districts until April of 1948 when he was promoted to manager of eyeglass frame sales. He was appointed assistant sales manager of the division last July.

In his new assignment he will be in charge of the sale and distribution of eyeglass lenses, frames, diagnostic instruments and ophthalmic equipment as well as the firm's safety eyewear and occupational vision program.

Jack Manufacturer Moves to New Plant

TEMPLETON, Kenly & Co., manufacturer of Simplex Jacks, has moved into its new plant in Broadview, Illinois, suburb of Chicago. The move to larger, more efficient quarters was dictated by the development of new products, particularly hydraulic jacks and pullers.

The single story plant, located on a five acre tract at Gardner Road and 16th St., Broadview, contains 96,000 square feet of space. The efficient one-floor layout of the plant permits smooth flowing production of all types of Simplex lever, screw and hydraulic jacks. A unique feature of the manufacturing section is a centrally-located mezzanine parts storage area which is easily accessible to both machining and assembly divisions. Shipping and receiving facilities include a four-truck dock and two-car rail siding.



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(For full details, use Key # P-18 on free Inquiry Card on page 77)

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(Use Key # P-19 on Inquiry Card on page 77)

Magcoa Appoints

THE appointment of F. E. Bennett Company, Portland, Oregon, as Magcoa sales representative in Oregon, was announced by Walter R. Gow, dealer manager, Magnesium Company of America, Materials Handling Division, East Chicago, Indiana. F. E. Bennett Company will handle a complete line of Magcoa products, including Dockboards, Yard Ramps, Hand Trucks, and Roller Conveyors.

George O. Bohrer has been named chief engineer the East Chicago, Indiana, plant of Magnesium Company of America. Mr. Bohrer, who for the last 3 years was an assistant plant manager of Continental Can Company, Chicago, succeeds the late V. J. Daniels. C. Ridgely Kemp, vice president in charge of production, was appointed to the newly created position of vice president in charge of research and development. William R. Davison, also a vice president of Magcoa, succeeds Kemp as vice president in charge of production.

Columbus McKinnon Promotes

DON S. Brisbin, Vice President, Sales, of the Columbus McKinnon Chain Corporation and its Chisholm-Moore Hoist Division, Tonawanda, New York, announces the promotion of seven staff members and the appointment of another to enhance the company's ability to serve its customers and to expand sales operations.

Promoted to Manager of Field Sales with headquarters at the home office in Tonawanda is F. T. Benjamin, formerly Chicago District Manager. Appointed to fill Mr. Benjamin's post is Karl L. Miller, formerly Assistant General Sales Manager of the Buffalo Bolt Company, North Tonawanda, who will be Regional Sales Manager in the Chicago area. Promoted to the positions of product Manager with headquarters in the Tonawanda office are E. J. Byrne, Hoists, G. F. Grace, Industrial Chain and R. E. Gerspacher, Automotive Chain. To the positions of Customer Service Manager, R. L. Pfanner, Hoists, O. H. Hager, Industrial Chain, and F. G. Schweitzer, Automotive Chain.

Eagle-Picher Adds New Plant Manager

ANNOUNCEMENT has been made by Glen J. Christner, vice-president and general manager of the insulation division of the Eagle-Picher Sales Company, of the appointment of Mr. John W. Kenney, Jr., as plant manager of all the Eagle-Picher diatomaceous earth operations at Clark, Nevada. Owing to Mr. Kenney's previous connection with one of the country's largest producers of diatomaceous earth, he brings many years of experience in this industry to his new position. He is widely known throughout the industry for his work in the quarrying, production, research and transportation phases of that unique mining operation.

Sindar Office Moves

THE Atlanta, Georgia office of Sindar Corporation, branch of Givaudan-Delawanna, Inc., has recently moved to larger quarters at 1156 Dalon Drive, N. E. The telephone number at this new address will be ATwood 0122.

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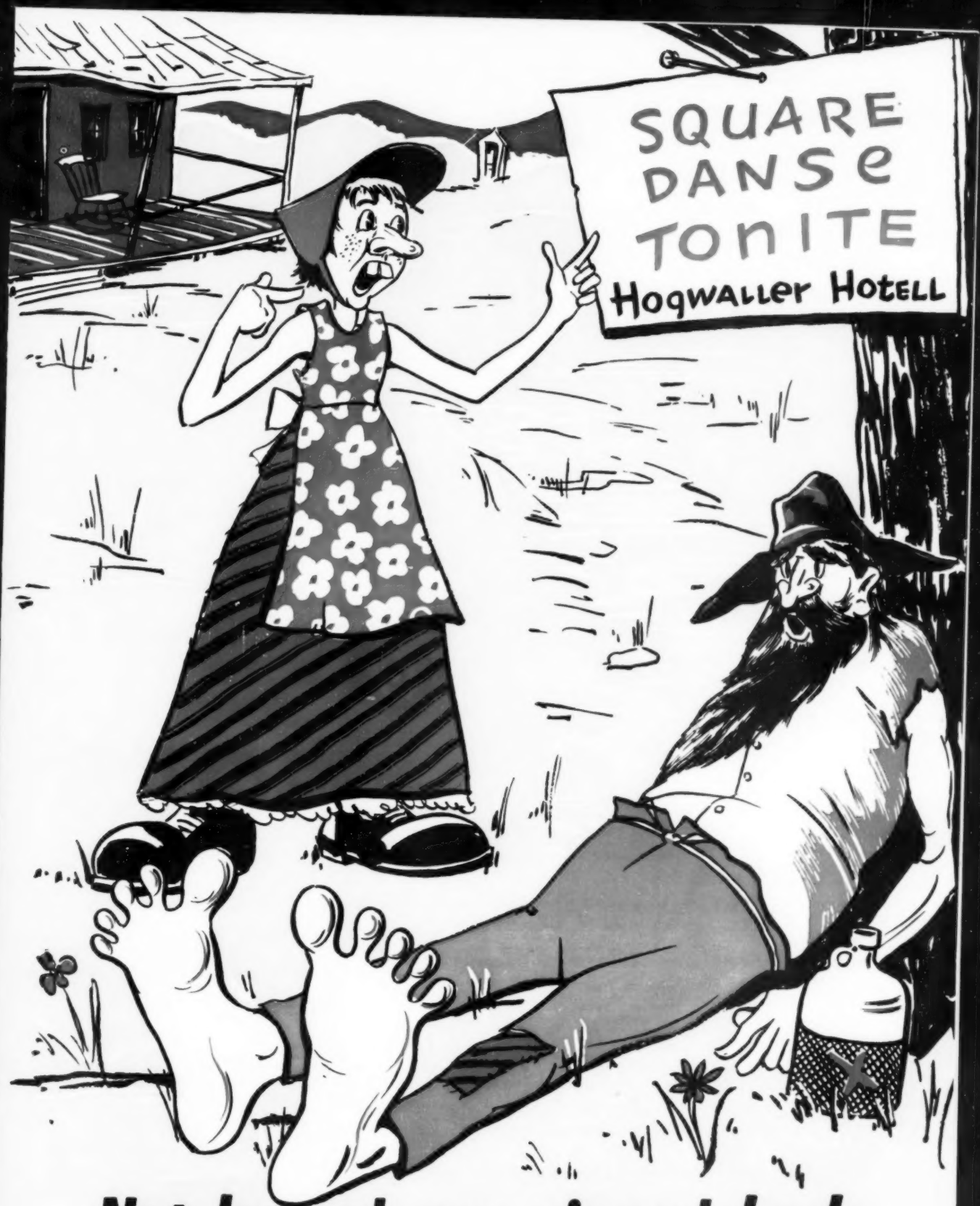

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"What's the Law?"

Edited by
HENRY M. GROSMAN
Counsellor at Law, Newark, N. J.

Master Superior Court, New Jersey
Member
American Bar Ass'n, New Jersey Bar Ass'n,
National Federation Insurance Council
Past Commander, American Legion, Post 10,
Newark, N. J.

Aggravation of Cancerous Condition

AN appeal to the Arkansas Supreme Court produced a ruling that inhalation of emery dust could accidentally aggravate a cancerous condition within the meaning of the Workmen's Compensation Law.

The deceased worker was employed as a saw-filer. He performed his duties in a poorly ventilated room which had no provisions for the removal of emery dust, filings and saw-dust. The floor of the room had large cracks through which fumes and dust entered from the saw mill located below.

The employee died of epitheliomatous cancer. A claim was filed alleging that the inhaling of emery dust and steel dust caused the death. In the lower court, compensation had been denied. *Scobey v. Southern Lumber Company, Arkansas Supreme Court, No. 4-9441, March 26, 1951.*

Total Vision Loss in Eye

The injured employee was hired to work as a floorman in a foundry. In the course of his regular employment, he was injured by some caustic acid which had splashed from the floor into his left eye. The employer agreed to pay the injured on the basis of 4.3 percent loss of vision in the left eye.

Weeks after the accident, a hole appeared in the lower part of his eye which was large enough to contain the head of a large match. The eye grew progressively worse and adhesions formed on the conjunctiva between the lower lid and the eyeball.

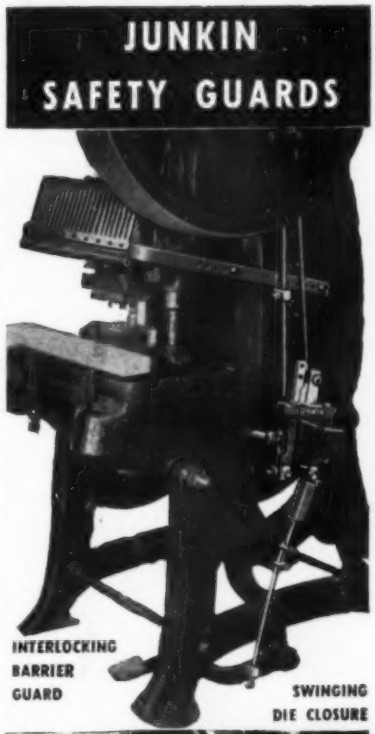
Two operations proved unsuccessful in removing this condition. Suddenly the eye went completely blind. The court held that medical testimony established a causal connection between the accident and the subsequent disability. *American Motorists Insurance Co. v. Blaylock, Georgia Court of Appeals, No. 33,536, June 5, 1951.*

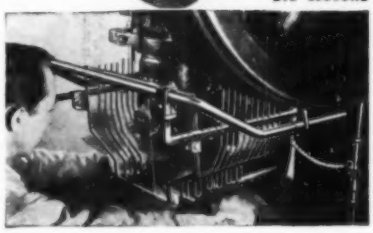
Failure To Use Safety Device

The employee was hired as a meat cutter in a packing house. While operating a meat cutting machine, he lost a portion of 3 fingers. Although there was a rake nearby which was a safety device, the injured did not use it, but reached out to remove some meat fragments with his hand and the descending blades amputated his fingers.

The employee stated that the machine was noiseless when the power was shut off and he had no way of knowing whether the momentum of the blades was exhausted since a metal shield hid the rotating blades. Other than the general instructions received on the first day of his employment, he had no specific instructions and the machine which was involved in the accident was not the one he ordinarily operates.

The court held that mere violations of instructions, orders, rules, ordinances and statutes and the doing of hazardous acts where the danger is obvious, do not constitute wilful misconduct. These violations may constitute negligence but





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(Use Key # P-21 on Inquiry Card on page 77)

such negligence does not bar a compensation recovery. *Armour & Co. v. Little, Georgia Court of Appeals, No. 33,483, April 25, 1951.*

Loss of Vision—One Year Later

The Tennessee Supreme Court ruled that the statute of limitations begins to run from the date that the injury is discovered by the claimant and not from the date on which the accident occurs.

The injured was employed as a saw operator in a saw mill. In the middle of June, 1949, the employee was struck in the eye by a foreign body which was thrown from the saw at which he was working. The employer received notice of this accident, but only one year later when the injured worker had lost sight in his eye.

The court affirmed an award in favor of the injured block-setter. *Roach v. Creekmore, Tennessee Supreme Court, June 16, 1951.*

Slippery Floor Leads To Back Injury

The employee was hired to tighten the screws on automobile doors on an assembly line basis with an electric screwdriver that weighed about 15 pounds.

In the course of his regular duties one afternoon, he slipped on the floor, where gasoline had been spilled, and although he caught himself before falling, he wrenched his back severly. A clinic diagnosed the injury as an acute back strain.

About 8 months later, the claimant's screwdriver broke and he again wrenched his weak back. Three weeks later he was unable to work. The court awarded him total disability for 350 weeks. *General Motors Corporation v. Deaton, Georgia Court of Appeals, No. 33,667, July 16, 1951.*

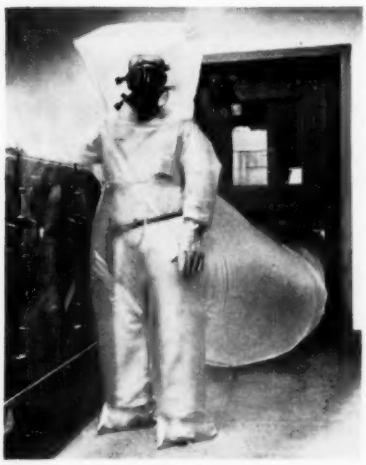
Negligence Caused Electric Shock

While employed by a foundry as a machinist, the employee was ordered by his foreman to go to an electric company and repair a turbine.

In doing this special work, the claimant employee was injured and he contended that the electric company was negligent. He alleged that no warning was given to him of the imminent danger and risk of an electric current jumping from a bus bar to his body while the body was wet with perspiration, and that he was not provided with rubber clothes and a rubber sheet.

He further alleged that a company electrician was present in the room and failed to give warning of the existing danger. The machinist suffered an electric shock and received compensation for about a year and one-half. Final settlement amounted to 3,012.58 dollars. *Scott v. Savannah Electric & Power Co., Georgia Court of Appeals, No. 33,615, July 16, 1951.*

The Cover Picture



THE picture on the cover shows the latest General Electric atomic attire now in vogue at its huge plutonium-producing plant in Richland, Washington, operated for the Atomic Energy Commission.

Plastic, balloon-like suit provides protective barrier against radiation in "hot" areas and permits a man to determine extent of contamination and do clean-up and maintenance work in such areas.

"Train" in rear is a flexible plastic tunnel leading from suit to entrance port in wall. It provides air and serves as an entrance and exit passage. Air mask worn is used only if, by some accident, the suit becomes torn or punctured.

N. Y. Labor Department Creates Safety Post

INDUSTRIAL Commissioner Edward Corsi has appointed Carl J. Mattei, to the position of assistant director of the Division of Industrial Safety Service of the New York State Department of Labor.

In this position, which is a newly created one officially, Mr. Mattei will continue to assist the division director, Arthur A. Farrell.

N. Y. Safety Convention Awaits 10,000 April 5

TEN thousand safety experts from all over the nation will gather in New York City for 5 days of conferences, starting April 5, aimed at reducing this country's annual accident toll of 95,000 deaths, nearly 10,000,000 injuries and an economic loss of $8,700,000,000.

New York's twenty-fourth annual Safety Convention and Exposition will be held in the Hotel Statler under the sponsorship of the Greater New York Safety Council and 73 co-operating agencies, among which are the Army, Navy, Atomic Energy Commission, Red Cross and business, civic, government and professional organizations. The convention will have 57 meetings, covering virtually all fields of industrial, highway, home, school, and public safety. The sessions will be addressed by more than 200 speakers, including federal officials, educators, law enforcement authorities, scientists, safety engineers and industrial executives. During the convention New York will observe "Greater Safety Week" in welcome to the accident prevention workers and to emphasize individual responsibility in avoiding accidents.

In conjunction with the convention the Greater New York Safety Council will hold an exposition of the latest developments in safety devices, demonstration of driving and drunkometer tests, and other aids to accident reduction. There will be 118 separate displays.

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The many combinations of Penoptic spectacle type safety goggles fill the eye protection needs of many industrial operations. Both the plastic and metal frame goggles are constructed to meet the most rigid tests. The clear or green safety lenses exceed all Federal Lens Specifications for protection from impact and glare hazards. All models are quick to win worker acceptance with their distinctive personal appearance, light weight and many other comfort features. Penoptic's manufacturer-to-you distribution lowers your cost of worker protection and assures a closer association with the people directly responsible for product performance.

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SAFETY ACHIEVEMENTS

ONE hundred and five of the safest industrial plants in the New York metropolitan area were named for awards by the Greater New York Safety Council. The winners in the Council's eleventh annual Inter-Plant Accident Reduction Contest represented a wide variety of industrial activity, including a Manhattan department store and a paint factory, an electronics laboratory and a brewery in Brooklyn, a Diaper service in Queens, the New York City Transit Authority bus repair shop and its IND subway division, a Long Island construction firm, Westchester buses, and the nation's biggest paperboard carton mill at Piermont, in Rockland County.

Fred F. Beik, contest chairman, reported that the cumulative accident frequency for 1953 was the second lowest in the eleven years since competitive records were kept. Accident frequency is the number of lost-time accidents per 1,000,000 man-hours of work. For the 1953 contest it was 9.78. The only year in which a lower accident frequency was established was 1952, when it was 9.55. The 1951 frequency was 11.97.

A total of 449 industrial plants, with 276,998 employes, took part in the 1953 contest. They performed 311,800,249 man-hours of work during the contest period, which runs each year from May 1 through October 31. Mr. Beik pointed out that the 1953 contest drew more than 100 new participating plants. In 1952 there were 338 plants with 205,215 employes who worked 219,627,959 man-hours during the contest period.

Awards were presented at the Safety Council's annual contest dinner at the Hotel New Yorker on Jan. 28. There were three types of awards, with some plants receiving more than one honor. Fifty-four plants received certificates of award for attaining the lowest frequency in their respective groups. Competing firms are grouped according to industry and type of hazards. Ninety-eight plants won certificates of merit for having gone through the contest without any accident. The latter group includes thirty-seven plants which are also first-prize winners in their respective classifications. Where more than one plant in a class makes an accident-free record, the prize for that classification goes to the plant that worked the greatest number of man-hours.

Two plants received certificates of special achievement for having worked more than 1,000,000 man-hours without a lost-time accident. They are the Bulova Watch Company in Woodside, Queens, and Lever Brothers Company.

First-place winners, by boroughs and counties, follow:

Manhattan—National Biscuit Company; Rikers, awards to three restaurants; Hotel Wellington, Inc.; Roto Bag Machine Corp.; James Gray, Inc., printers; 100 Park Avenue, Inc.; Lever Brothers Co.; Ohrbach's, Inc.; New York City Transit Authority (Manhattan bus shop); Marcy Hotel Corp.; Brown, Harris, Stevens, Inc. (for operation of 1450 Broadway building); American Lumbermen's Mutual Casualty Co.; Powers Photoengraving Company.

Brooklyn—Piel Brothers; Pioneer Ice Cream division of The Borden Company; The Brooklyn Hospital; Fein's Tin Can Company, Inc.; Republic Steel Corp. (steel and tubes division); Borden's Farm Products (Gates Avenue garage); Kay Manufacturing Corp. (sisal dept.); New York City Transit Authority (separate awards to outside plant, IND operation, trolley shops and cars, Ninth Ave. trolley depot, Flatbush Ave. bus depot); Ex-Lax, Inc.; Metropolitan Greenhouse Manufacturing Corp.; Atlas Can Corp.; Stauffer Chemical Co.; Joseph Aronauer, Inc.

The Bronx—Fred M. Schildwachter and Sons; Third Avenue Transit Corp. (West Farms shop); National Gypsum Co.

Queens—American Chicle Co., Long Island City; Long Island Drug Co., Inc., Jamaica; Bulova Watch Co., Woodside plant; National Container Corp., Long Island City; General Diaper Service, Elmhurst.

Staten Island—Procter & Gamble Mfg. Co. (general division, process division, and edible division).

Westchester—Sonotone Corp. (Elmsford plant); Borden's Farm Products (White Plains branch and Mount Vernon garage).

Nassau—Sperry Gyroscope Co., Great Neck.

Rockland—Beckerle-Brown, Inc., Pearl River; Wm. S. Doig, Inc., Haverstraw; Robert Gair Company, Inc., Piermont; Rockland Light & Power Co., Hillburn plant.

New Jersey—Railway Express Agency, Inc. (West Shore Terminal), Weehawken; American Brake Shoe Co., Inc., Mahwah; Dairymen's League Co-operative Association, Newark.

LAST month, Daystrom Instrument Company of Archbald, Pa. announced completion of one full year with no lost time injury in 3,295,479 man-hours to February 11th.

The Award of Honor has been granted by the National Safety Council, and Daystrom's insurance carrier has awarded a plaque to the company for its outstanding safety accomplishments under the direction of John R. Perry, Safety Director of Daystrom.

THE American Brake Shoe Company has awarded for the first time a new President's Safety Trophy to its National Bearing Division plant in Meadville, Pennsylvania for having the best safety record of all the company's 58 plants. The Meadville plant won the award for having only 3 reportable injuries in 826,077 man-hours during the year, or an accident frequency rating of only 3.6 accidents per million man-hours worked. Last year the plant was in 17th place among the company's 58 plants and in the previous year ranked 34th.

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So we want to thank each and every company with whom we have done business over the past years. We want you to rejoice with us on reaching this milestone in our history.

We pledge ourselves to continue to design and manufacture safety clothing and equipment that will merit your enthusiastic approval and use.

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TRANSPORTATION SAFETY

SAY THANKS... FOR SAFETY

By McCOLL PRINGLE

GRANT the basic premise that motorists have notoriously bad manners. Grant also that good driving manners contribute greatly to safety. These statements need not be proven. They are generally accepted.

How then can good manners be encouraged? Why not in the same way that good manners of any kind are encouraged . . . by appreciation? Still another question: how can this appreciation be expressed?

What is needed is some simple means of expressing this appreciation for a courtesy shown by the other driver. A signal, easily and quickly given, and not distracting, would fill the bill. A ready way of saying "thank you" should be available to the country's millions of motorists. Car manufacturers supply directional-light signals for showing intention. Perhaps a device to indicate appreciation can be made standard automobile equipment.

Meanwhile, every driver can contribute to courtesy on the road, and increase the safety of all, by giving a "thank-you" sign when he is conceded the right-of-way, for instance, or waved ahead of a slow truck on an upgrade. Here's how: the recipient acknowledges the politeness by two light taps on his horn, in quick succession. No more effort than that is needed. A spark of good-will has been struck, and both parties will be inclined and alert to deal considerately with the next car they encounter.

Professional drivers have recognized a camaraderie of the highway for some time, and are usually considerate of each other. Often they use a similar "thank you" signal. This good feeling could spread as the double-tap signal gets into general use. By tap-tapping when helped, any driver can join this fraternity. No dues to pay! Meetings held on the spot and very short. Membership unlimited.

See how many musical "thank yous" can be earned in a day's driving. The rewards in safety and happiness are so great that everyone should join, for safety is, certainly, everybody's business.

Northwestern U. Center Studies Transport Field

THE establishment of a national Transportation Center at Northwestern University has been announced by President J. Roscoe Miller. The new center will carry on a program of research, undergraduate training, and graduate study aimed at the solution of major problems in the highway, rail, air, pipeline and water divisions of the nation's transportation industry.

The center is a joint undertaking of the university's School of Commerce, Technological Institute, and Traffic Institute. An advisory committee of business and professional men interested in transportation will be formed to aid in the formulation and direction of the center's activities.

"Transportation is such a vital factor in modern living," said President Miller, "that it seems desirable to expand the work of Northwestern University in this field. Because of its rapid development, transportation has become increasingly complex and has created many unsolved problems—economic, technical, and social."

Carolina Truck Official Wins Promotional Award

J. T. OUTLAW, Executive Vice-President of North Carolina Motor Carriers Association, has won first place in the nation for outstanding promotional activities in observance of "Truck Transportation Week." Mr. Outlaw, who served as co-chairman for TTW, received a congratulatory letter and

a 100 dollar check from the directors of ACT (independent advisory committee to the trucking industry) sponsors of the national contest.

"Your achievements are particularly noteworthy because of the general high standard of reports submitted," stated the ACT Directors: Dave Beck, President, International Brotherhood of Teamsters; Walter F. Carey, American Trucking Associations, Board Chairman; Roy Fruehauf, President, Fruehauf Trailer Co.; and B. M. Seymour, President, Associated Transport, Inc.

The ACT Committee reported that "Honorable Mention" excellent reports were received from: Texas, Wisconsin, Kansas, Arkansas, Colorado, and Rhode Island.

Traffic Safety Program

CHIEF executives of New York State communities have been urged to "pitch in and clean up the traffic mess."

Speaking at the annual meeting of the Association of Towns in New York City, Dr. Walter A. Cutter, assistant director of New York University's Center for Safety Education, advised the New York mayors and other town executives to supply the leadership in all efforts to solve traffic safety problems.

"The state, and the towns, can form such a pattern of vehicle use in our streets and highways that people will be forced into that life-saving pattern or be denied the driving privilege until they can take their place safely."

Stressing the necessity for police enforcement of traffic laws, Dr. Cutter told the mayors that "we need more and we need better enforcement—enforcement that is consistent and intelligently applied, and, above all, enforcement that is coordinated with all other necessary procedures that are helping to achieve traffic safety."

Dr. Cutter declared that the courts represent "one of the serious weaknesses in dealing with traffic offenders, most of whom need rehabilitation rather than punishment." He added that too many courts "are not doing a good job," with the result that "court experience becomes not a constructive part of the enforcement process but a further contribution to the general confusion."

The New York University safety specialist recommended to the mayors and town officials the New York State program of the Insurance Industry Committee on Motor Vehicle Accidents as a specific plan of practical assistance for meeting local traffic headaches. He also urged them to participate in the annual Traffic Safety Inventory of the National Safety Council. He described the insurance industry committee's staff of specialists in traffic engineering, police administration, traffic court procedures, and public support as "an integrated team."

Pointing out that this community traffic safety aid program is the first comprehensive approach of its kind made to the highway accident problem by any private industry, he said New York State has become "a laboratory in which methods and techniques for dealing with the highway accident toll may be worked out on a coordinated basis." Twenty-seven communities, ranging in population from 10,000 to 150,000, are now taking part in the program, he said.

"The Insurance Industry Committee program has special timeliness in view of the announced purpose of the February White House Conference on Highway Safety to 'bring about greater public support for highway safety in every state and community.' The Insurance Industry Committee program gives New York State communities an opportunity for a head start on a safety campaign at the local level which has been nationally approved and too long delayed."

a little thing like a salt tablet* can prevent a big thing like accidents

It's an established fact that as the heat curve goes up, so does the accident rate. Salt sweated out must be replaced, or else your workers become easy victims of *heat fatigue*. When this happens, carelessness results and costly accidents can occur.

***Morton Yellow Impregnated Salt Tablets** combat this safety threat easily, safely and inexpensively. Their controlled action gives *immediate* relief *without causing nausea,* as each salt crystal is thoroughly impregnated by a special patented process that controls the tablet's rate of dissolving. In this way, salt is replaced *immediately,* but at a *gradual* rate.

Morton Patented Impregnated Salt Tablets are included in a new Disposable Dispenser. A plastic and a heavy-duty aluminum dispenser are also available, as are plain salt tablets.

If your local safety equipment distributor cannot supply you, write:

MORTON SALT COMPANY
Dept. S-A 13, 120 So. La Salle St.
Chicago 3, Illinois

(For full details, use Key # P-24 on free Inquiry Card on page 77)

As never before...

Today we are all aware of the disastrous and far-reaching effects of a major industrial fire. Owners . . . management . . . employees . . . customers . . . almost every one suffers, in one way or another, when a serious fire strikes.

Could it happen to your plant? Now is the time to take a long, close look at your plant's fire protection measures. Remember, the local fire protection ordinances normally only set minimum standards. Compliance with these ordinances is no guarantee of fully adequate firesafety.

One way to be absolutely sure of the efficiency of your plant's fire protection facilities is to call in an expert C-O-TWO Fire Protection Engineer. He is ready and willing to help you with any or all industrial fire hazard problems.

There is a personal sense of responsibility inherent with C-O-TWO Fire Protection Engineers that assures you of fully adequate firesafety . . . a definite plus in your behalf. Whether it's fire detecting or fire extinguishing . . . portables or built-in systems . . . C-O-TWO means top quality backed by experienced engineering that results in operating superiority for you at all times.

WHEN BUSINESS STOPS . . . INCOME STOPS!

Don't take chances with your investment. Secure the benefits of highly efficient fire protection engineering today . . . our extensive experience over the years is at your disposal without obligation. Get the facts now!

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The Fire Front

1953 Fire Losses Highest On Record

FIRE damaged or destroyed an estimated $903,400,000 worth of property in the United States last year the National Board of Fire Underwriters reports. This is 15.1 percent higher than in 1952, when monthly losses totaled $784,953,000.

According to Lewis A. Vincent, NBFU's general manager, 1953's fire losses are the highest on record for the third consecutive year. He says the losses reflect to a large degree the nation's expanding economy, particularly those insurable values exposed to fire that have increased proportionately, and include the result of the disastrous fire last August at the Livonia plant of the General Motors Corporation.

Mr. Vincent noted also that losses for the month of December were particularly heavy, amounting to $83,440,000 an increase of 22.6 percent over losses of $68,064,000 for November, and an increase of 12.6 percent over losses for December, 1952, when they amounted to $74,127,000. These estimated losses include an allowance for uninsured and unreported losses.

FIRE LOSS TABLE

Month	1953	1952	1951
January	$76,659,000	$74,155,000	$68,686,000
February	72,706,000	69,925,000	69,136,000
March	83,471,000	72,254,000	71,507,000
April	67,362,000	67,380,000	62,965,000
May	64,239,000	62,354,000	58,744,000
June	67,644,000	58,585,000	56,403,000
July	74,938,000	61,675,000	52,220,000
August	107,713,000	56,462,000	55,416,000
September	68,613,000	58,949,000	53,398,000
October	68,551,000	63,958,000	54,660,000
November	68,064,000	65,129,000	60,064,000
December	83,440,000	74,127,000	68,206,000
TOTAL	$903,400,000	$784,953,000	$731,405,000

Edgar Slack To Direct Fire Engineer Training

THE National Board of Fire Underwriters announces it has retained Edgar P. Slack, professor and chairman of under-graduate physics at Brooklyn Polytechnic Institute, as director of its new program of fire engineering training for recent college graduates.

The program consists of a course of instruction and on-job training in fire protection engineering, in particular the engineering surveys of the fire fighting facilities of major cities in the United States.

In administering the program, Professor Slack also will serve as liaison with deans of engineering schools throughout the nation, bringing to their attention the activities of the National Board in the field of fire protection engineering, and the need for the service of engineering graduates in this expanding area.

Professor Slack, writer of several well-known books on physics and electricity, co-authored with Erich Housman, former dean of Brooklyn Polytechnic Institute, a text on this subject which has been used by a majority of engineering schools. A native of Abington, Mass., he received his BS degree from Massachusetts Institute of Technology in electrical engineering and his master's degree in physics from New York University. He has taught at Brooklyn Polytechnic Institute since 1926. For 15 years prior to joining the faculty of Brooklyn Polytechnic Institute, from which he is presently on leave, Professor Slack worked as an electrical engineer, and later as chief inspector, for Underwriters' Laboratories, Inc., in New York.

Engineering students who are interested in this field of activity are invited to write for further information to the National Board's chief engineer, John A. Neale, at 85 John Street, New York 38, N.Y.

Fire Education Program Now Made Available

THE Fyr-Kote Company, manufacturers of Underwriters' Laboratories listed fire retardant finish, has made available a complete educational program for use by municipalities and Government agencies.

Demonstrations, films and technical consultants are available to appear on convention programs, safety conferences, meetings, etc.

Full information regarding this program may be obtained from A. Sophir, c/o Fyr-Kote Division, 27th & Douglas St., Omaha, Nebraska.

Fire Prevention Code

REPORTS are received daily of death and destruction by fire and explosion. These are usually the result of a combination of circumstances, a common contributing factor being the improper handling and use of flammable and explosive commodities. For example, fire and explosion caused the death of several persons in a midwestern state when a compressed flammable gas was liberated; a manufacturing plant in an eastern state blew up because of lack of knowledge of the behavior of certain chemicals used; a machine shop, using a new alloy, had a disastrous fire.

The introduction of cellulose nitrate motion picture film produced many serious fires, until suitable laws were passed for its safe storing and handling. The many millions of gallons of gasoline in use could not be handled without catastrophes were it not for the safety provisions which the petroleum industry has thrown around this highly flammable liquid. Hazardous new chemicals and materials of various kinds and new uses of plastics are being introduced daily in manufacturing processes. Paint spraying and dipping operations, using flammable materials and solvents, have become common practice in many industries. Many plants often take on work foreign to their normal operations, and general business is frequently speeded up to increase production. Therefore proper safeguarding of industry is of vital importance at all times.

Much progress has been made in fire prevention and a great deal of effective work is being done in cities, towns, and villages throughout the country, but in the great majority of cases full effectiveness is not being obtained from the time and effort being expended upon such work according to the National Board of Fire Underwriters. This is because of the incompleteness or lack of laws, ordinances, or regulations governing the numerous features which must be given consideration in fire prevention. It is sometimes argued that there is no necessity of a city or town adopting a complete and comprehensive code on fire prevention because the town does not contain many of the hazards covered by such a code. However, every growing community is sure to have these hazards introduced sooner or later, and it is better to be prepared for them than to allow them to develop unrestricted and then try to regulate them.

The National Board of Fire Underwriters has for many years issued information covering hazards which affect the home as well as the place of business. In the form of a "Suggested Fire Prevention Ordinance" this was first issued in 1930; a number of subsequent editions were issued, the latest being a completely revised edition published as the Fire Prevention Code, recommended for adoption by cities and towns. For communities which feel that their needs can be cared for by a briefer code, the National Board of Fire Underwriters also publishes an abbreviated edition of the Fire Prevention Code.

Three principal methods by which municipalities adopt codes of this kind are as follows: (1) setting forth the entire code in an ordinance, (2) adoption of the code by reference or title, (3) adoption of an ordinance specifying compliance with the code as *prima facie* evidence of compliance with national recognized safe practice. Methods 2 and 3 avoid the large cost of publishing the entire code locally.

The Fire Prevention Code contains in Appendix E a suggested ordinance providing for the establishment of a bureau of fire prevention and for adoption of the code by reference. Many cities throughout the country have adopted earlier editions of the code by reference. The following wording is suggested for use in adopting the Code by the *prima facie* evidence method:

> The storage, handling and use of flammable or explosive substances and the use or occupancy of buildings or premises shall be in conformity with nationally recognized safe practice for the safeguarding to a reasonable degree of life and property from the hazards of fire or explosion.
>
> Compliance with the provisions of the Fire Prevention Code recommended by the National Board of Fire Underwriters shall be deemed to be *prima facie* evidence of compliance with such nationally recognized safe practice.

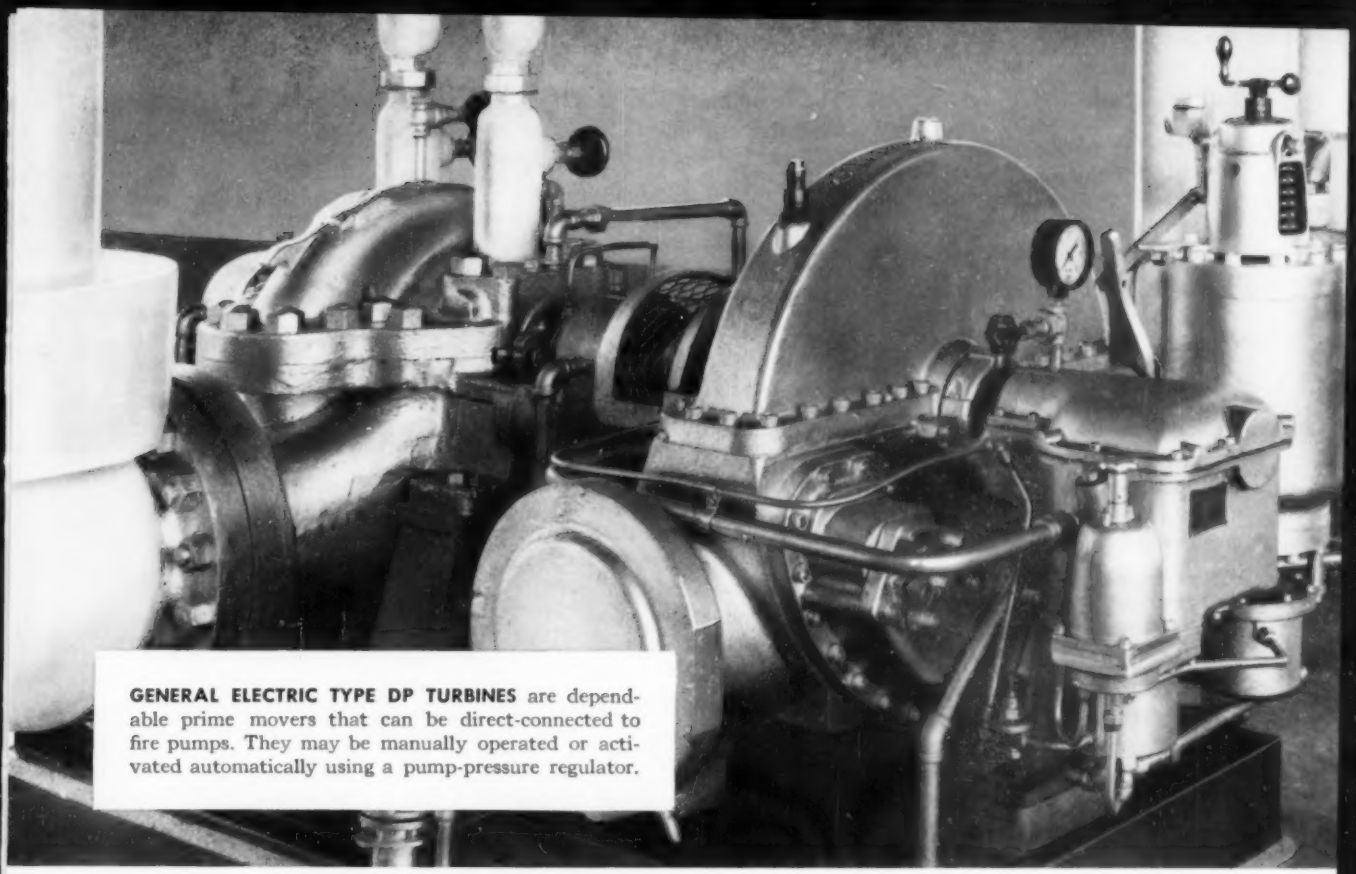
Copies of the Fire Prevention Code, or the abbreviated edition, may be obtained free by persons having an interest in the code as well as by committees considering local codes. Copies will be supplied on request to the board at 85 John Street, New York 38. Parties located in the Middle West should write to 222 West Adams Street, Chicago 6, Ill., and, if west of the Rockies, to 465 California Street, San Francisco 4, Calif.

The National Board of Fire Underwriters furnishes sufficient free copies to any municipality which adopts the code to care for their official needs (that is, distribution among interested municipal employees, plus 25 copies) and supplies additional copies in such quantities as may be desired at a price less than cost of publication. Any city or town which adopts either code will, on request with notification of such adoption, be furnished 1 to 3 sets of the Standards of the National Board of Fire Underwriters and the appropriate official of such town or city will be placed on a mailing list to receive future issues of the standards.

Appendix Revised For National Building Code

THE National Board of Fire Underwriters has just published a 48-page pamphlet of fire resistance ratings which is a revision of Appendix A of its National Building Code.

The pamphlet is of particular interest to architects and building engineers, as well as public officials interested in fire safety in buildings. In addition, *(Continued on page 48)*



GENERAL ELECTRIC TYPE DP TURBINES are dependable prime movers that can be direct-connected to fire pumps. They may be manually operated or activated automatically using a pump-pressure regulator.

Can Turbine Drives Make Your Plant Fire-protection System More Dependable?

For truly comprehensive plant fire protection, pump drives must be ready for immediate and continuous operation. To help meet these requirements, General Electric Type DP turbines are built to fire-protective code* standards. They have simple, rugged construction, are quick starting, and afford dependable operation.

Available at ratings up to 1200 hp for fire-pump service, these standard Type DP turbines have thousands of hours of proved dependability on regular commercial applications. Features that make them especially reliable for fire-pump drives are:

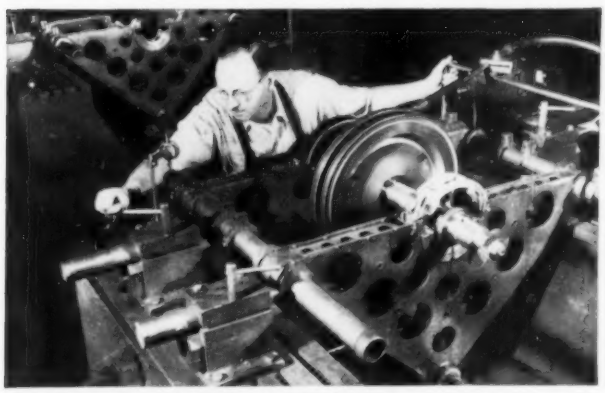
A totally enclosed hydraulic governing system that keeps moving parts to a minimum and eliminates exposed linkage that might wear or corrode.

A compact, pressurized lubrication system that provides more than ample oil, minimizing bearing burnouts during rapid starts, and assuring continuous operation even under adverse conditions.

A sturdy, well-balanced rotor that enables turbines to attain full speed quickly.

Be sure to consider these important features of General Electric turbines for fire-pump drives when planning or reviewing your plant fire-protection system. For additional information, contact the nearest General Electric Apparatus Sales Office or write for GEA-6099, "Mechanical-drive Turbines for Fire Pumps." Address Section 252-67, General Electric Company, Schenectady 5, N. Y.

*National Board of Fire Underwriters' Pamphlet No. 20.



PROPER BALANCE OF TURBINE ROTORS is essential for quick-starting pump applications. Rotors for Type DP turbines are given static and dynamic balancing tests to assure smooth operation throughout the range of turbine speeds.

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(For full details, use Key # P-26 on free Inquiry Card on page 77)

Building Code

(From page 46) the National Board says, it is of value for use in connection with other building codes in force in any community and is by far the most complete tabulation of its kind ever published.

The pamphlet contains a number of tables on fire resistance ratings of beam, girder and truss protections; ceiling constructions; column protections; floor and ceiling constructions; roof constructions, walls and partitions. The easy-reference tables are set up in terms of minimum requirements for specified fire resistance and in such form as to fit the requirements for hours' fire resistance given in building codes.

Single copies of the pamphlet are available free of charge on request to the National Board of Fire Underwriters, 85 John Street, New York 38, N. Y. In the Middle West, write to 222 West Adams Street, Chicago 6, Ill., and west of Rockies, to 465 California Street, San Francisco 4, Calif.

LP-Gas Safety

IN 1926, 465,000 gallons of LP-gas were produced for 5,000 customers. In 1952, 4,100,000,000 gallons were produced for industrial and domestic use with 70 percent of this total being consumed in an estimated 8,000,000 domestic and farm installations, reports National Board of Fire Underwriters' bulletin.

LP-gas consists principally of propane and butane, though isobutane, propylene and butylene are also used to a lesser extent. For commercial and domestic purposes, mixtures of propane and butane are frequently used. These hydrocarbons are in a gaseous state under normal atmospheric conditions but can be liquefied by moderate pressure, and are transported and stored in a liquid state. When this pressure is removed, they return to the gaseous condition. LP-gases are obtained from oil and natural gas wells and from certain operations in natural gasoline plants and oil refineries. The separation of propane and butane from natural gasoline is accomplished by fractional distillation. The cracking processes used in oil refineries also yield these hydrocarbons in a substantially pure state.

Propane and butane are flammable, nontoxic, colorless gases, of slight natural gas odor.

With its boiling point of —44°F., propane has the advantage of being self vaporizing at normal atmospheric temperatures in all sections of the country. Because of the inability of butane to vaporize readily at temperatures below freezing, its marketing for domestic uses has been confined to the southern sections of the United States. Two disadvantages of propane are its lower heating value and higher vapor pressure, the latter necessitating heavier tanks and equipment.

In the gaseous state the fire hazard of LP-gas is comparable to any flammable, natural or manufactured gas except that being heavier than air, any escaped gas is likely to collect in pockets at low points. The hazard of storage in the liquid state is greater than that of gasoline since LP-gas must be stored under pressure. LP-gases must be odorized to aid in detecting leaks. The storage and handling of LP-gas should be in accordance with the "Standards for Liquefied Petroleum Gases," National Board of Fire Underwriters Pamphlet No. 58, or at gas utility plants according to the "Standards on Liquefied Petroleum Gas at Gas Utility Plants," Pamphlet No. 59.

Under the Basic Rules of Pamphlet No. 58, containers and storage tanks must be installed outside of buildings, and aboveground storage has been general practice. As a result of the Warren Petroleum Propane Fire at Port Newark, New Jersey, there is a trend toward burying the tanks in spite of the attendant problems of proper inspection and increased corrosion. Tanks of over 2,000 gallons individual capacity, when installed either aboveground or underground are required to be at least 50 feet from the nearest important building or line of adjoining property that may be built upon and 5 feet must be maintained between aboveground containers.

Safety devices for the relief of excessive internal pressures in tanks are essential. Since the vapor pressure increases as the temperature increases, it is evident that if a tank is heated by an exposure fire the pressure will increase rapidly. To prevent this all tanks must be equipped with safety relief valves in accordance with Appendix A of Pamphlet No. 58. The vents from such valves must be piped 7 feet above the container. Means which have been used to provide greater fire protection in large bulk storage installations are: burying the containers, insulating the containers, water spray protection systems, gas detection and alarm systems, staggered spacing of groups of tanks, and erection of barrier walls. In industrial installations involving containers of 150,000 gallons aggregate capacity or more, provision should be made for an adequate supply of water for fire protection in the tank area, unless other means for fire control are provided.

The best method of handling LP-gas fires is to shut off the gas at the source, if possible, and to allow escaped gas to burn. This procedure will prevent the escape of unburned vapors to form dangerous accumulations elsewhere. If it is deemed advisable to extinguish the escaped gas, this can best be accomplished with a stream of dry chemical or carbon dioxide. When an LP-gas cylinder is exposed to excessive heat, the container should be kept as cool as possible by applying a water stream to it. This keeps the pressure down and the relief valve working at a minimum or reduces the pressure sufficiently so that the valve will close.

Night Traffic Toll

Where lighting has been made adequate, night traffic deaths have been reduced an average of 60 percent. The 1952 night traffic toll was 20,520 deaths, 729,000 injuries, $2,025,000,000 economic loss.

FASTER

MORE EFFECTIVE... MORE DEPENDABLE

FIRE-STOPPING POWER

MODEL 20-B

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Chemical Company
FIRE EQUIPMENT DIVISION • MARINETTE, WISCONSIN

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FIRE EXTINGUISHING EQUIPMENT

FASTER . . . A short, quick downward motion of the puncture lever pressurizes the extinguisher and it is ready for instant use.

MORE EFFECTIVE . . . Even the inexperienced operator gets near-expert results because of the ease of operation and handling. In addition ANSUL *"PLUS-FIFTY"* Dry Chemical has greater fire-killing power.

MORE DEPENDABLE . . . Exclusive ANSUL-ENGINEERED design features include water-tight and corrosion-resistant construction, easy, on-the-spot recharge without special tools and other exclusive Ansul developments which insure greater dependability.

FIRE-STOPPING POWER . . . ANSUL FIRE EXTINGUISHERS have the highest ratings for fire-stopping power ever awarded any type of class B and C fire extinguishing equipment.

Send for File No. B-212. You will receive a variety of helpful printed matter. Included is our latest catalog which describes Ansul Extinguishers of all sizes — from the small Ansul Model 4 to Ansul Piped Systems and Ansul 2000 lb. Stationary Units.

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GREATER PERSONNEL PROTECTION THAN EVER BEFORE

safety engineers, industrial hygienists, industrial engineers and production men are

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(low toxicity—high flash)

and are safe-guarding personnel from nausea, vomiting, abdominal cramps, headaches, dizziness, jaundice, loss of memory and the more harmful effects on the lungs and the liver.

Combined with the exceptional safety features is the extreme **CLEANING AND DEGREASING** effectiveness of **F.O.-128.**

ADVANTAGES OF F.O.-128

- Minimized toxicity — fifteen times more safe than carbon-tetrachloride.
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- Will not produce dermatitis.
- Perfect for cleaning electrical and mechanical equipment without damage to surfaces or insulated components.
- Zero residue on drying.
- May be used in process cleaning for pre-paint or pre-plate operations.

WRITE TODAY for information on this and other FINE ORGANICS' "SAFE-TEE" Solvents. *Representatives in Principal Cities.*

*See July 1952 issue of *Industrial Hygiene and Occupational Medicines*

Write to Dept. "B" for FREE technical bulletin "How to Clean Electric Motors."

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(Use Key # P-28 on Inquiry Card on page 77)

New Low Reached By Manufacturing Injuries

MOVING counter to the usual seasonal pattern, the all-manufacturing injury frequency rate dropped to a new low for the third quarter of 1953, according to preliminary reports compiled by the U. S. Department of Labor's Bureau of Labor Statitistic.

The average of 13.9 disabling work injuries per million employee-hours worked during the third quarter of 1953 was 7 percent below the previous third quarter low of 14.9 recorded in 1952. More significantly, it was also 1 percent below the average of the second quarter of 1953. This is the first time in 9 years that the all-manufacturing injury-frequency rate for the third quarter has been lower than in the second quarter of the same year.

As a result of this unusual improvement in the third quarter, the cumulative frequency rate for the first 9 months of 1953 also reached a new low. At 14.0 it was 5 percent below the corresponding rate for 1952.

As an indication of the stability of the favorable trend, the 9-month cumulative rates for 48 industries in 1953 were below their 1952 levels; for 56 they were essentially unchanged; and for only 29 were they higher. The most substantial improvement occurred in the lumbering group of industries, but notable rate reductions also appeared in the furniture, primary metals, machinery, and instrument manufacturing groups. Many of the industries showing improvement were still in the high injury-frequency rate brackets. Logging again topped the list with a rate of 80.7 for the first 9 months of 1953. Sawmills had a rate of 55.2, integrated saw and planing mills a rate of 39.4, and the structural clay products industry a rate of 37.6.

In contrast, industries with outstandingly low injury rates for the first 9 months of 1953 included: synthetic fibers, 1.2; miscellaneous communication equipment, 3.0; synthetic rubber, 3.0; rubber footwear, 3.4; aircraft, 3.4; electric lamps, 3.6; explosives, 3.7; radio tubes, 3.8; and electrical vehicle equipment, 4.6.

Oil Handling Safety Emphasized In Film

"PAGEANT OF PROGRESS," a sound-slide film which emphasizes the many safety measures employed by oil men in tank truck and underground storage operations has been added to the film library of the American Petroleum Institute's Safety Section. Running time is 15 minutes. It is in black-and-white. The film spells out the safety features of tank trucks, and the many measures adopted to minimize storage hazards at service stations.

Also available is a take-home leaflet, which can be distributed to audiences. The leaflet points out that petroleum tank trucks have fewer accidents than most other types of trucks. The only hazard of any consequence associated with underground storage tanks occurs while filling them; accordingly, the larger the tank, the fewer times it must be filled, thereby reducing potential hazards.

"Pageant of Progress" was produced originally by Humble Oil & Refining Co., Houston, Tex. It is being made available to the industry as a whole through the API Safety Section film library. Prints may be obtained from the Texas Industrial Film Co., 911 M & M Building, Houston 2, Tex., or through the API, at 25 dollars each. One hundred copies of the take-home leaflet are provided with each purchase. Additional copies of the leaflet for separate distribution are available at cost from API headquarters.

Other films currently available through the Safety Section film library are these: "Minutes That Count (Part I)"; "Minutes That Count (Part II)"; "Thermal Forces"; "Hazardous Helper"; "More Than Magic"; "Petroleum Fires"; "Fog Techniques in the Extinguishment of Oil Well Fires."

Going Up!...But Not In Flames!

ABOVE—First flight of YH-16, giant troop-carrying helicopter. Fire protection on ground removed danger of aircraft burning before it had been flight tested.

RIGHT—Fire department inspector shows employee how to use dry chemical extinguisher to put out gasoline spill fire, a type of fire often encountered around aircraft on ground.

Since dry chemical is the only fire-extinguishing agent being used to protect the giant helicopter at left, when it is on the ground, inspection is a daily routine to be certain unit is in perfect working condition in case of emergency.

EVER since fire destroyed a 57-passenger Constellation during refueling operations, aircraft insurance companies have become increasingly concerned with the problems of fire protection while aircraft are on the ground.

Recently, engineers at the Piasecki Helicopter Corp., in Morton, Pa., solved the vexing safety problem of protecting a multi-million dollar helicopter in an outdoor area. Capable of carrying 40 troops, 32 litter patients, or 3 jeeps, the twin-engined helicopter represented 8 years of research, design and construction. With such an investment involved, company officials had to make sure their revolutionary new machine would be safe from flames.

The solution was to place 1,270 pounds of dry chemical, stored in wheeled, stationary and hand extinguishers of varying sizes, near the helicopter. One of the main difficulties centered around the fact that the ground testing station for the aircraft had to be located in a relatively open area so that there would be little or no property damage or injury in case of an accident. There was no public hydrant or other water supply nearby, and without water it was impossible to provide the customary water fog and foam fire protection. Furthermore, by the time the local fire department could lay long lines and relay water from the nearest hydrant, the craft would be lost.

Adding to the complications was the fact that the company's heavy crash fire truck could not be made available for the entire duration of the ground tests, scheduled to take place over a period of many months. Had this crash truck been assigned to the helicopter area exclusively, all the company's other test flight operations would have had to be cancelled. Carbon dioxide extinguishers were used for fire guard on engine start-ups, but were unsuitable for other purposes because of the out-

door location and the strong downward blast effect of the copter's rotor blades.

Dry Chemical Used

Instead, the final solution was the installation of dry chemical fire extinguishers. Dry chemical is nothing more than specially-treated bicarbonate of soda, which, upon contact with the flames, releases many times its own value in carbon dioxide gas, which quickly smothers the fire. Dry chemical has been used before to protect aircraft and other airport installations against fire, but this is the first time that the company had depended solely upon dry chemical to protect a property as valuable as the helicopter. The reason a dry chemical was chosen is its unique ability to smother a fast-spreading gasoline fire, such as could occur around the helicopter. Laboratory tests conducted by fire insurance companies show that dry chemical can extinguish larger gasoline fires more quickly than any other extinguishing agent, according to the firm's Safety and Fire director.

Fire equipment, however, is only as good as the men who use it, and the ground crew assigned to serve the helicopter has been thoroughly trained in the use of the equipment. In all, some 1,270 pounds of dry chemical can be brought into play in a matter of seconds, as a result of a concentration of four 30-pound hand extinguishers; one 350-pound wheeled unit; one 500-pound stationary unit, and two 150-pound stationary units. Also available, in case of metal fires, are five 30-pound special extinguishers.

Pictures by courtesy of Ansul Chemical Co.

New Chairman Elected For NSC Rubber Section

THE new general chairman of the executive committee for the Rubber Section of the National Safety Council is Robert W. Fickes, Assistant Manager of the safety division of Goodyear Tire & Rubber Company.

Mr. Fickes begins his term of office on an auspicious note: new low injury frequency rates have been established by the rubber industry for the first 6 months of 1953. The industry as a whole had an injury rate of 3.1 for the period and the rubber footwear industry was right behind with a 3.3 average. In addition, two Goodyear plants attained perfect accident-free records in October while working the most man-hours in the industry during that month.

Mr. Fickes came to the company in 1933 as a member of the Production Squadron. After a brief time in advertising, he went to sales. In 1941 he became safety director of the company's aircraft division, in which capacity he served during World War II. Following this he returned to the company's tire plant in the safety department where he holds his present post.

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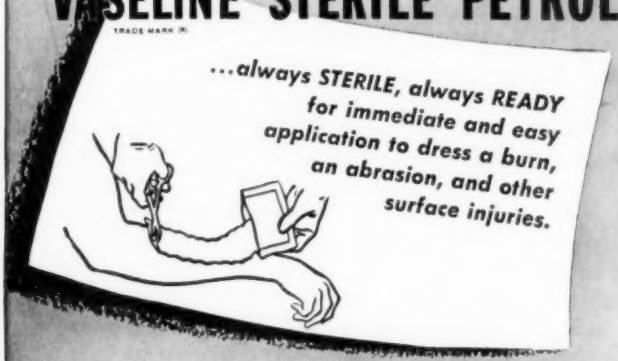
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Industrial Hygiene

Associate Editor
Jacob A. Goldberg, A.M., Ph.D.

Five Ways to Reduce Noise

ENGINEERS of industrial equipment can take a tip from brother engineers in consumer item fields in the elimination of operational noise, according to Dr. E. G. Meiter, director of industrial hygiene and chemist for a leading insurance organization.

Dr. Meiter points out that engineers of automobiles, electric refrigerators, vacuum cleaners and electric fans all have made long advances in recent years in reducing operational noises in their products.

While this has been done in a competitive way to please the consumer, the noise reduction engineering has not advanced far enough in the manufacture of equipment for industrial plants, Dr. Meiter says.

"The logical place to attack noise in industrial plants is at the place where it originates—at the source in the factory machines themselves," Dr. Meiter says. "With good engineering design, much noise can be eliminated. This is evidenced by new consumer products we use every day—automobiles and electric household appliances, all of which are quieter than the older ones.

"The quieting of modern street cars and subway trains are additional examples. Modernization of equipment will, therefore, in many instances result in reducing excessive noises."

Good maintenance of factory machines, whether new or old, also will aid in reducing needless noise, according to Dr. Meiter. Gear noises can be reduced where applicable by substituting herringbone gears or V-belt drives. Rotating parts that fit loosely may produce excessive noise. He also points out that rattling of loose housing, covers, and safety guards are additional sources that can be corrected.

"While there are many aspects to the industrial noise problem, the principal ones are: (1) high noise intensity may produce permanent hearing losses; (2) noise intensity can interfere with speech communication, which leads to (3) that such noise can cause industrial accidents because warning signals can't be heard," says Dr. Meiter.

Besides controlling noise at the source, five other general approaches exist for reducing or eliminating noise, Dr. Meiter says. One is by substitution of processes, such as welding instead of riveting. Another is isolation or segregation of noises, such as by walling in excessive noise sections. Use of resilient mountings for machinery—on rubber or steel springs—is another noise reducer, along with the use of sound-absorptive materials on walls and ceilings.

The fifth approach uses employees themselves by the prescribing of ear protectors to reduce the intensity of sound. Ear plugs, says Dr. Meiter, are as necessary for protection of ears as is the use of safety goggles for the protection of eyes. However, he says ear protection should never be used as a substitute for noise control; it should be resorted to only when noise remains too high even after control.

Industrial Health Conference

INDUSTRY and management problems regarding the health and safety of industrial workers will be thoroughly discussed at the 1954 Industrial Health Conference at the Hotel Sherman in Chicago from April 26 to April 30.

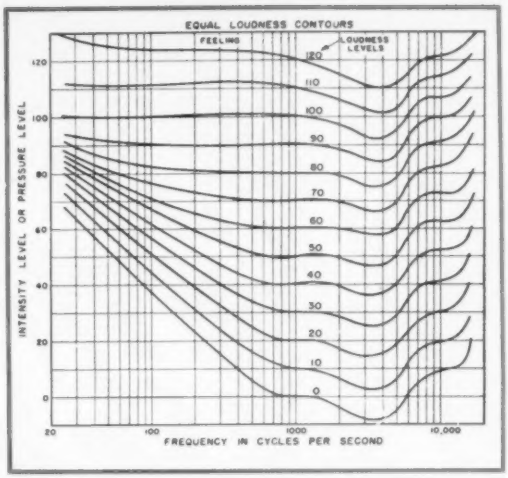
Over 2,000 leaders in industrial health from the United States and Canada are scheduled to attend the 5-day meeting. Theme of the Conference will be "Protecting our greatest industrial wealth—employees' health." The conference will include 5 different groups vitally interested in the industrial health field—the med-

(Continued on page 62)

Fig. 1 Fletcher-Munson equal loudness contours showing the ear's non linear response to different frequencies at varying loudness levels.

Fig. 2 Noise study with compact sound level meter and analyzer is rapid.

Fig. 3 Octave band levels are plotted on loudness contours to calculate a total loudness correlated with the ear's subjective impression of sound.



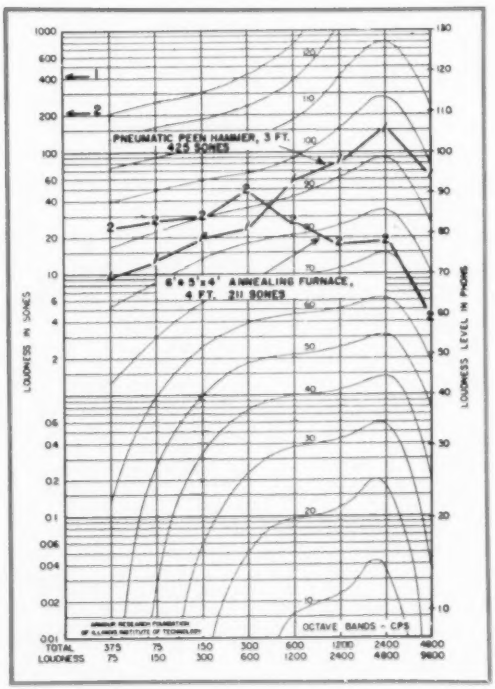
FEATURE By VICTOR H. POMPER

Second article of a feature series on Industrial Noise Control. The next article will appear in the April issue.

Assistant General Manager
Hermon Hosmer Scott, Inc.
Cambridge, Massachusetts.

NOISE MEASUREMENT AND ANALYSIS

IN THE war on noise, the more precisely deployment of enemy forces is known, the greater are the chances for successful attack. Noise must be accurately measured and analyzed before it can be controlled effectively. This article discusses noise measuring and analyzing instruments, their development, features and limitations. Unfortunately, the noise problem is complex. Like sin, we are mostly 'agin' it, though a little may be overlooked. In intemperate doses, noise may cause partial hearing loss, stress reactions, and interference with communications. Yet under some circumstances, moderate steady noise may possibly mask distractions and so actually increase production or morale.



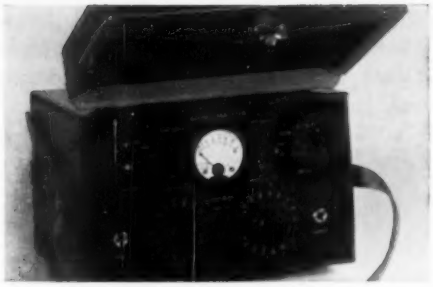
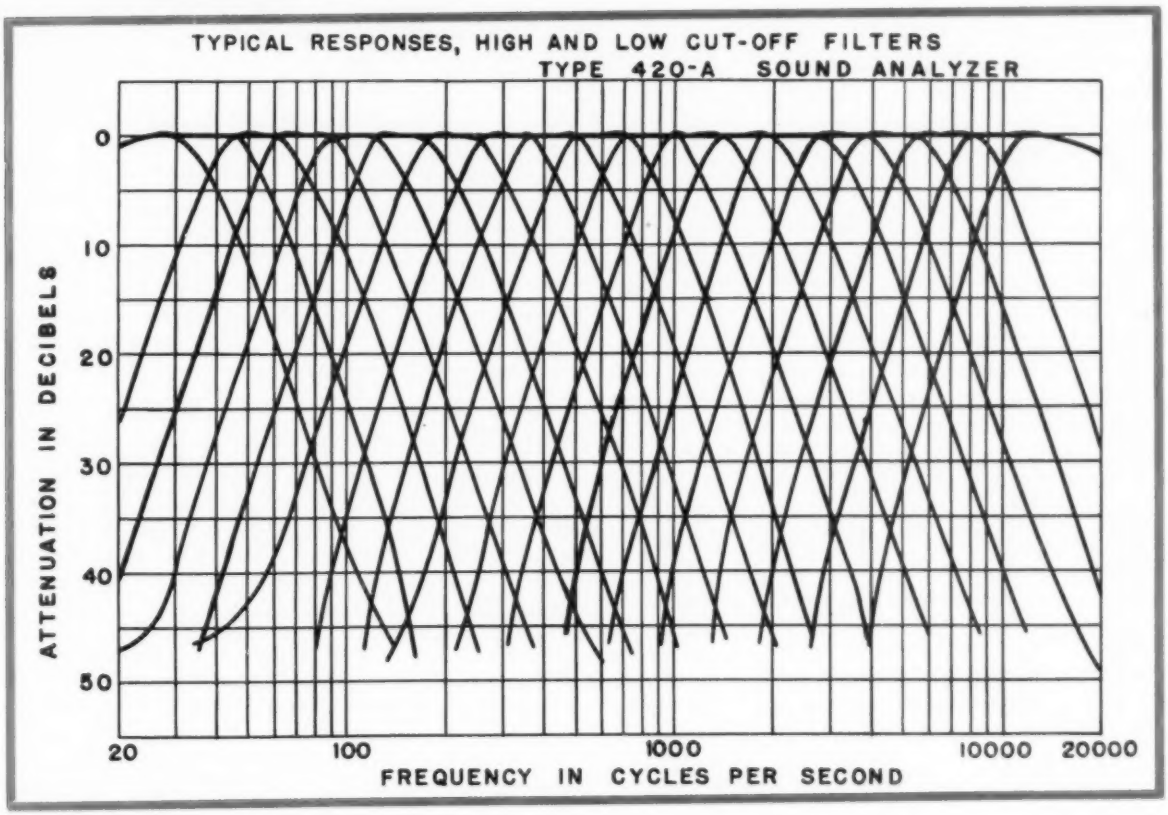


Fig. 4 A modern noise band analyzer with separate high and low cut-off filters, adjustable in half octave steps for desired passband widths.

Fig. 5 Filter curves of adjustable half-octave analyzer illustrates "resolution" of measurement possible, smooth passband response, and cut-off characteristics.

Fig. 6 A typical sound level meter shows both its portability and the standard controls as specified by the American Standards Association.



The noise problem has long been with us but its hazards have not been fully appreciated until recently. Amid alarms, counter-alarms and disputes among experts, too many overburdened managements have taken the attitude "Let's ignore the so-and-so, maybe he'll go away." But no such luck.

To the safety engineer falls the responsibility of scouting the enemy, determining its strength and convincing headquarters (management) to give him resources to fight it. The safety engineer cannot avoid responsibility for following-through in measuring, analyzing, evaluating and controlling noise. He owes it to his company to protect employees from the possible harmful effects of unchecked noise.

Noise and Hearing

When is there a noise problem? As a rough rule-of-thumb, if two people at arm's length have trouble talking to each other, that is, above noise levels of about 90 decibels, further study is needed since the noise may be dangerous. Effects

of noise depend on length of exposure, individual susceptibility and the character of the noise itself.

Without delving into physics, let's define noise as unwanted sound. Sound, in turn, is an audible alternation in air pressure, and also the auditory sensation caused by such pressure variation on the ear. Industrial noise may be classified under 3 headings: (1) steady narrow-band noise in which a fundamental frequency predominates, such as the whine of a circular saw, (2) steady wide-band noise in which many frequencies predominate, such as the racket from a number of machines, and (3) transient noises. The latter may vary rapidly in pitch or in volume or they may take place intermittently. Transient noises include single-impacts from slow machines such as drop-forge hammers, as well as repeated-impacts from fast equipment such as riveting machines and pneumatic hammers.

Steady noise is fairly easily measured and evaluated to reasonable accuracy with existing instruments as standardized by the American Standards Association. Transient or intermittent noise is more difficult to evaluate since the instantaneous peak levels are far above the average or RMS (root mean square) levels read by conventional sound measuring equipment. Therefore the measurements may not indicate the true annoyance or danger to the individual. This presumably is one important reason why, in some cases, estimates of loudness by listeners may differ noticeably from readings obtained with standard instruments. Transient noise sometimes may be very difficult to evaluate except by complex laboratory techniques.

The ASA standard sound level meter is by definition a sound *pressure* measuring device, not one for measuring loudness as heard by the ear. It reads RMS sound level or, in some cases, average sound level which is not greatly different. The organizations and individuals who devised the original standards were well aware of the limitations, and they pointed out precautions in making measurements with this equipment. However, despite its limitations, the sound level meter is an accurate, dependable device providing repeatable readings of physical sound pressure levels with a degree of accuracy impossible in estimates or subjective observations. In writing the standards no attempt was made to make sound level meters conform to characteristics of the human ear, since these are so complex that they are not fully understood at present and consequently cannot be duplicated by any man-made equipment. Experience has shown, though, that standardization was wise in spite of its limitation to RMS sound pressure.

Average normal hearing responds to frequencies from about 15 cycles per second to over 15,000 cycles per second. The loudest sounds to which the ear responds are more than 10 million times the sound pressure of the least audible signal. Thus the ear functions over wide ranges of both loudness levels and frequencies. Further, the ear responds differently to different frequencies at different levels of loudness. Fig. 1 shows the Fletcher-Munson equal loudness contours. At high loudness levels the ear responds more or less uniformly to all frequencies, but, as the loudness level decreases, the ear becomes increasingly insensitive to very low frequencies or very high ones.

The extreme sound pressure range of hearing, over 10 million to 1, results in use of unwieldly numbers in measurements. Consequently, acoustic measurement of sound pressure is defined by a logarithmic unit, the decibel, abbreviated db. This reference level is normally the faintest sound discernible to a person of particularly acute hearing.

Noise Instrument Background

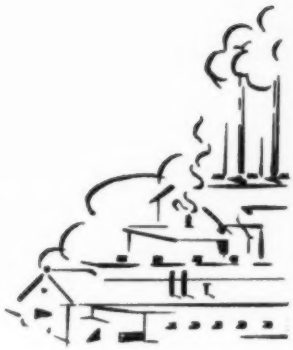
Not too many years ago, before stable microphones and amplifiers were developed, measurement of sound pressures was complex even by laboratory standards, involving Rayleigh disks and other gadgetry of classical physics. The first commercial sound level meters were complex units filling several suitcases with instrumentation and batteries. At best, several men were needed to transport this unwieldy gear.

About 15 years ago, a sound level meter weighing about 23 pounds was designed,(1) a compact and, by existing standards of that time, lightweight sound meter. Shortly thereafter, a companion fixed-percentage band-width analyzer weighing about 35 pounds was developed. However, a strong man was needed to carry both these units any distance, and field use was consequently awkward and inconvenient.

Basically, the modern sound level meter is a direct descendent of the original single instrument developed by H. H. Scott. Fundamentally, it consists of a microphone which picks up the sound, an electronic amplifying system with attenuators and frequency-response selection networks and an indicating meter. The chief advances in sound level meters have been technological, including sub-miniature components which allow greater convenience and portability, more stable amplifying circuits and use of vacuum tubes which are less sensitive to microphonics caused by physical vibration of the tubes at high sound intensities.

In modern measurements, analysis of the noise waveform is considered essential. Such analysis often gives clues both as to the cause of the noise and its actual hazard in problems of industrial deafness, masking of speech by noise, and employee stress reaction. Of the analyzing equipment, the cathode-ray oscilloscope is not well adapted for field use and it does not provide readily usable data. *(Cont'd on page 59)*

(1) A widely sold sound level meter, and the first entirely practical unit weighing as little as twenty-three pounds, was first described in the following paper: H. H. Scott, "Industrial Need Brings New Instrument Design" (1939 Product Design Prize-Winning Paper) Elect. Mfg., Vol. XXIV, No. 4, Oct., 1939, pp. 64–68. Earlier pioneering models were also described in the following papers: H. H. Scott, "Inexpensive Noise Measuring Equipment", General Radio Experimenter, Vol. VII, Sept. 1953; and H. H. Scott, "Commercial Noise Measurements", General Radio Experimenter, Vol. VII, No. 10, March 1933; H. H. Scott, "Convenience in Noise Measurement—A Really Portable Sound Level Meter," General Radio Experimenter, Vol. XI, No. 4, September 1936.



Physicians in work classification unit "tune in" on patient. They are using an electron cardioscope, which broadcasts and records sound of heart, and delineates the sound on television-like screen.

CARDIACS CAN WORK!

In the first place heart disease is not caused by work . . . In the second, the economic loss is too serious to permit cardiacs to remain unemployed . . . and most important, techniques have been developed to fit cardiacs to their proper jobs . . .

INDUSTRY knows how important is the control and management of cardiovascular disease. Heart disease ranks first in the leading causes of death in the United States; almost 34 percent of the total. These deaths are not all of employees in their fifties and sixties. A few occur in the twenties and early thirties; a surprising number, in the late thirties and forties; and, of course, increasing numbers, in the fifties and sixties. The prevention of these deaths, many premature, of course, is a challenge, but an even greater challenge is that of rehabilitating and managing the thousands of employees who have, or develop, cardiovascular disease of one type or another. Nearly 4 million persons in the United States are estimated to have heart disease and the number continues to grow.

In one large company the number of cardiacs who are working runs to more than 1000. All large industries and most small industries have cardiacs among their employees. Industries cannot escape this. It is true that companies vary in their employment policies with respect to cardiacs. However, cardiovascular disease is so prevalent, and develops so insidiously and suddenly that companies could not, if they would, exclude all cardiovascular diseases from their employees. So in industry, the basic problem is not to exclude cardiovascular disease, but to deal with employees who have or develop it. The increasing number of older workers with heart disease is another problem facing industry. These older workers represent an investment in skill and experience, making continuance of their good health of great importance to management.

What Is a Cardiac Disease?

The employment of cardiacs is hindered by legislative acts which order compensation boards to disregard evidence and automatically to rule that all heart disease occurring in certain jobs is service connected. More obstructive are legal decisions that say that disability from heart disease developing during employment need not be dependent on any unusual strain. This infers that work is an evil and giving a job to a cardiac does him an injury.

The evidence that 40 percent of all men over 40 years of age have significant changes in their coronary arteries is a potent force in hindering the employment of men over 40–45 years of age. This is a danger-

ous social trend in view of the aging population of the United States and the average length of life of almost 70 years. Indeed, it can be destructive, economically.

Industry should not be held automatically responsible for all the hazards of life. The ordinary activities of living produce circumstances similar to those of employment during which a chronic, slowly developing heart condition may be revealed. Less than one-quarter of a person's life is spent on a job with a 40 hour week.

Most cardiacs at present considered for employment fall into 5 groups. (1). Those with congenital heart disease which has been completely cured by surgery, such as a patent ductus arteriosus and coarctation of the aorta. They are employable and as good as new. (2). Those with mild rheumatic heart disease or with mitral stenosis relieved by operation. They are suitable for selected jobs and need primarily prompt treatment if they acquire respiratory infections. (3). Those with essential hypertension. They have good employment records, especially if kept under medical supervision. (4). Those with mild angina pectoris on effort or after good recovery from myocardial infarction. They are the hardest to fit into industry except in highly skilled jobs. They may die on the job, but this is more likely when they are not at work, and employment should not be held responsible in the absence of trauma or unusual strain. (5). Those with peripheral vascular disease who need protection from foot injuries.

Another bit of evidence indicating the lack of relationship between work and degenerative heart disease is the fact that in the past 30 years the death rate of white males in this country between the ages of 35 and 54 has doubled while that of the white females in this age period has remained the same; and this increase is visible only in the deaths from cardiovascular disease. This has occurred at a time when the employment of women has increased very markedly. Either heart disease selects only men workers, which appears likely, or work in industry is no harder for women than work in the home. In any event more women are employed, but relatively fewer are dying of heart disease.

The first thing one must determine is whether a person is a cardiac or not. This implies the avoidance of the label until the evidence is clear. It also implies seeking out those who are not yet aware of the fact. The value of such a process to everyone in industry should be obvious. More trouble can be anticipated from the unknown cardiac than the known one.

Work and The Heart

The diseased heart is no different than the normal heart in its response to stress, except that its reserves are lower. Diseases of the heart cause stresses in themselves on the one hand and encroachments upon the upper limits of effective performance on the other. This means less reserves for ordinary stresses.

Work, one's vocation, like play, one's avocation, is a normal state of affairs. It is as normal as pregnancy and eating. Therefore work to which one is accustomed cannot be detrimental per se. One would have to blame sleep and taxes as much as work for cardiac disability. There is no more reason why an employee who develops a heart attack at work should be considered to have developed it because of the work, than there is to blame sleep when such an attack occurs during sleep. If it can be shown that the employee was subjected to an excessive stress, not ordinarily sustained on the job, the situation is different.

No work situation, however, can cause coronary closure or infarction of the heart, unless there is a pre-existing coronary arteriosclerosis present, except when there has been a penetrating or severe non-penetrating injury of the chest. Work

(Continued on page 68)

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Noise Measurement

(Cont'd from page 56) Recording of the noise for later analysis usually is not necessary. This leaves the so-called noise band analyzers.

The constant bandwidth, or heterodyne analyzer,[2] can be tuned continuously to individual frequencies or narrow bands of frequencies. This type of instrument is heavy and unwieldy by present standards, and is generally unsuitable for portable field use. While sometimes used for noise measurement, it was designed primarily for analysis of purely electrical phenomena in which various components are constant in frequency. In most types of industrial noise, various noise components are frequency modulated or occupy bands of frequencies. With this type of analyzer and its inherent narrow-band width, serious errors are introduced where noise signals are frequency modulated unless the bandwidth of the analyzer is widened. This requires either greater complexity and bulk in the instrument or decreased attenuation outside of the desired passband, thereby adversely affecting the resolution with which a signal may be analyzed. Further, such narrow band measurement is a painstaking and time-consuming process, particularly when the noise varies.

To overcome this problem, another type of analyzer has been developed in which the band-width remains a constant percentage [3] of the passband center frequency as the instrument is adjusted. In this instrument, any error caused by frequency modulation affects all readings equally, and the relative values of noise components are not altered. However, industrial noise is by nature complex; frequently the noise character is intermittent or fluctuates in a random manner. The requirement that valid readings be taken in reasonable time has led to widespread use of filter-type octave and half-octave analyzers. These give readings of the noise levels existing within discrete frequency bands throughout the audible spectrum. In effect, the total sound energy is separated into a series of adjacent bands of noise and the intensities of these bands may be expressed in a simple table of levels. Such an analyzer is readily used by relatively untrained, non-technical personnel.

Original filter-type analyzers weighed 100 pounds or more, and the weights of common commercial models have been reduced from 60 to 37 pounds. However, within the last several years a unit, including also half-octave bands, has been introduced and weighs only about 20 pounds. The octave band analyzer has received wide acceptance because of its simplicity and convenience and the fact that readings may be taken quickly. An important step forward, however, is the analyzer adjustable in half-octave bands. In designing or quieting machinery, it is often desirable to know whether or not the frequencies of highest sound level correspond with natural resonances in the machine or with harmonics of the rotational speed. These resonances and the rotational speed are fairly easily measured or calculated. Since harmonics differ by a factor of 2, it is merely necessary to know the frequency closer than by a factor of 2 to determine which harmonic is the offender. For this purpose, the ½ octave analyzer is entirely adequate and considerably quicker than a continuously tunable analyzer. Normally, the conventional octave band analyzer does not give sufficient "resolution" in measurement for certain applications of this type. A typical sound level meter and half-octave band noise analyzer are shown in use in Fig. 2, illustrating the very real portability and convenience of modern noise measuring equipment.

The Microphone

The weakest link in the accuracy of the sound level meter is the microphone with its requirements for very wide range, high stability and great sensitivity. The American Standards Association specifies tolerances of ±2 decibels in the mid-frequency ranges, and increasing somewhat for higher and lower frequencies. This tolerance, consequently, is normally responsible for differences between sound level meters of different

(2) Early application of the Heterodyne-type analyzer is described in: H. H. Scott, "The Analysis of Complex Sounds of Constant Pitch", General Radio Experimenter, Vol. IX, No. 12, May 1935.

(3) The first constant percentage bandwidth analyzer is described in: H. H. Scott, "Audible Audio Distortion," Electronics, January 1945, pp. 126-131, and Proceedings of the National Electronics Conference, 1944, Vol. 1, pp. 138-145; "Designed for Use" (1937 Product Design Prize-Winning Paper) Electrical Manufacturing, Vol. XX, No. 4, Oct. 1937, pp. 61-65.

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manufacture, and of the same manufacture if different microphones are used, since the instrument readings may differ by several decibels and still be well within specifications. Since most manufacturers can supply meters with equivalent microphones, microphone differences between these types are cancelled out for *comparative* readings.

The typical sound level meter is normally furnished with a piezo-electric crystal microphone having a response within the tolerance limits specified by the American Standards Association from 25 cycles to about 8,000 cycles. Since the crystal microphone may be affected by extremes of temperature above 120 degrees F, and under a few conditions by extremes of humidity, a moving coil or dynamic microphone must sometimes be used with a matching transformer. Response and sensitivity of this microphone is substantially similar to that of a Rochelle salt crystal microphone.

Under certain circumstances, a wider range microphone may be desirable to measure very high frequency noise. While condenser microphones with preamplifiers are available, such equipment is delicate and considerable care is required for field use. For the relatively few wide-range measurements required in industry, newer moving coil microphones with frequency responses up to about 15,000 cycles are more than adequate. Any of the microphones mentioned may be safely used at levels up to 140 or 160 decibels. For the few applications generating louder noises, special microphones are available which can withstand the actual physical impact of noises up to about 200 decibels. For most industrial purposes, though, the standard crystal or moving coil microphone furnished with commercial sound level meters is more than adequate.

The Modern Sound Level Meter

Performance of modern sound level meters is carefully specified by the ASA, so meters differ chiefly in convenience and portability.[4] A typical commercial sound level meter is shown in Fig. 2. The unit shown is the smallest, lightest and lowest priced instrument meeting all ASA requirements, and for these reasons has received wide acceptance wherever dependable sound measurements are necessary. The illustration also indicates the relatively few simple controls of the instrument, readily usable by non-technical and untrained personnel. These controls are essentially those found on any standard sound level meter conforming to the requirements of the American Standards Association.

At one end of the barrel is a removable crystal microphone which may be replaced with other types. Below that are the controls: OFF-ON, Decibels, Weighting and Meter. Below these is an output jack for connection to a suitable analyzer. At the far end of the barrel is an indicating meter. The barrel type construction avoids a plane reflecting surface beneath the microphone which may lead to sound-reflection phenomena interfering with readings. The Meter switch permits checking voltages of hearing-aid Mercury A cell batteries and calibrating hearing-aid B battery voltage before making readings. This switch also affords a choice between fast and slow indicating meter ballistics, the former for following fairly rapid fluctuations in sound pressure and the latter for obtaining averaged readings.

The Weighting switch offers a choice of 3 separate frequency response networks, A, B and C, as specified by the ASA. The A (40 db) response approximates the human ear's response to sounds of from about 35 to 55 decibels. The B (70 db) scale approximates the response of the ear from about 55 to 85 decibels, while the C (flat) curve affords a flat frequency response conforming to the response of the ear at levels above 85 decibels and for laboratory measurements and use with analyzer. These response curves are approximately smoothed inverses of the 40 decibel, 70 decibel, and flat response curves shown on the Fletcher-Munson equal loudness contour curves in Fig. 1. However, since the ear's response to complex tones presumably differs from its response to the pure tones by which such curves were obtained, and since the C (flat) curve is normally used with analyzers, in modern practice the A and B scales are infrequently used.

The Decibels switch is an attenuator with a range increasing in 10 decibel steps from 40 through 80. The OFF-ON switch turns the meter on and provides an additional 50 decibel attenuator. The indicating meter itself is calibrated from -6 to $+10$ decibels, therefore the minimum range is 34 decibels, and the maximum range is 140 decibels. On this instrument, readings below 34 decibels are deliberately omitted since at the very low energy levels represented by readings below 34 decibels inherent vacuum tube noise becomes appreciable and may lead to inaccurate and misleading readings. Levels below 34 decibels are seldom encountered in practical noise surveys. In fact, most people would consider 34 decibels as almost perfect quiet since it is approximately the level encountered in broadcast studios and other locations which are treated against outside noise. Even the sound levels in offices and homes almost never reach this low level.

Filter-type Noise Band Analyzers

A typical filter-type sound analyzer is shown in Fig. 4. The versatility of "resolution" in this type of instrument is better shown by the sharp cut-off filter curves of Fig. 5, which also shows the smooth filter responses within the passbands of noise to be analyzed. This instrument has separate high cutoff and low cutoff filters adjustable in half-octave steps, as shown by the two large calibrated dials in the figure. Consequently, a pass-band may be obtained which has a band-width

(4) Modernization techniques as applied to sound level meters were first described in: H. H. Scott, H. Christie and E. G. Dyett, Jr. "Application of Miniature-circuit Techniques to the Sound Level Meter," Proceedings of the National Electronics Association, Vol. IV, pp. 33-45, 1948; also see "Sound Level Meter" Electrical Manufacturing, October 1949 (1949 Electrical Manufacturing Award Prize-Winning Paper.)

of any multiple of one-half octaves. This pass-band width may be locked by the small knob between the two main filter dials so that the desired band-width is maintained throughout the audible spectrum.

At lower right is an output jack for connection to a recorder or earphones if desired. The input jack for connection to the sound level meter is at lower left. At upper left is a calibrated attenuator and between it and the meter is a control for calibrating the analyzer with a particular sound level meter. At upper right is a switch for turning the instrument on or off, giving a choice of fast or slow meter ballistics and checking battery voltages. Between this and the meter is a control for adjusting the B battery voltage to the proper value before using the instrument. This type of instrument affords greater versatility in measurement though it is a bit more costly than the conventional octave-band filter which has two important disadvantages. First, the usual octave band filter has no cutoffs below 75 cycles, where many machinery noise fundamentals lie, or above 4,800 cycles where there may be annoying high frequency components. Further, the "resolution" obtained with simple octave band analysis is inadequate for many applications. Instruments such as the one shown,[5] which can be operated suspended from the user's shoulder as in Fig. 6, are real improvements over the first bulky, ungainly filter-type analyzers weighing over 100 pounds.

Loudness of Noises With Differing Characteristics

With the sound level meter and in conjunction with a noise band analyzer, valid, meaningful measurements and analysis can be made of noises of differing character, allowing subsequent correlation with loudness levels as heard by the ear. Fig. 3 shows octave-band levels of two machines whose total noise output is the same, 102 decibels, though the curves indicate a differing character of noise. These octave band analyses can be correlated to loudness levels with the chart also given in Fig. 3.

This chart is used for calculating loudness as discriminated by the ear. Octave band levels of the machine noises are plotted on this graph in order to obtain the total loudness in sones. A sone is defined as the loudness of a thousand cycles per second tone which is 40 decibels above the ASA reference level and it correlates well with physiological impressions of loudness. From the chart, the loudness in sones for each octave-band is read from the scale at left. These octave band loudness readings are then added arithmetically to obtain the total loudness. Both sounds have an overall intensity level of 102 decibels, but the loudness levels actually are 425 and 211 sones respectively for these sounds differing in frequency characteristics. It can be seen, therefore, that these values confirm the ear's interpretation that one sound was considerably louder than the other, which actually was the case.

Thus, frequency band analyses give essential confirmation concerning the sound by providing a reading which correlates with the ear's evaluation and by affording precise information about the character of the sound. Such analyses often give valuable clues toward controlling the noise.

(5) This flexible filter-type analyzer is described in: H. H. Scott and D. von Recklinghausen, "A Compact, Versatile Filter-Type Sound Analyzer," The Journal of the Acoustical Society of America, Vol. 25, No. 4, pp. 727–731, July 1953.

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Calibration of Instruments

To maintain accuracy of measurement and analysis, precise calibration of sound measuring instruments is important. At the factory, the instruments are calibrated and checked against laboratory standard microphones and meters. In the field, however, it is possible for instruments to change calibration for one reason or another, such as accidental adjustments which affect the calibration, tubes becoming microphonic, etc. Normally, the leading sound level meters and noise band analyzers are extremely stable and reliable with but minor drift in calibration. Instruments of the type shown, for example, use carefully selected subminiature vacuum tubes which have been electrically aged for over 50 hours to achieve stabilization of their operating characteristics. However, methods of calibration in the field still are useful, particularly if legal action or other dispute on effects of noise depends on the absolute accuracy of the measurements.

THE INSIDE STORY
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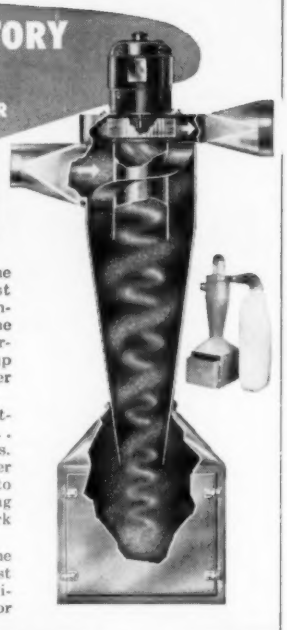

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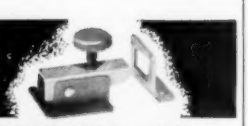

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Several different types of field calibration devices are available including calibrated whistles, acoustic calibrators and electrical calibrators. In this author's opinion, the whistle-type calibrator is not sufficiently stable nor accurate to be relied upon. The so-called accoustical calibrator, which involves an oscillator, voltmeter and small diaphragm-type loudspeaker is better, although, since the stability of the loudspeaker is less than that of the microphone and electrical circuits, this type of calibration may leave something to be desired.

The most reliable means of calibration available at the moment, in the author's opinion, is procurement from the manufacturer of a microphone carefully matched to the characteristics of the microphone on the sound level meter in question. This matched microphone, maintained with care, affords a standard of comparison against which the sound meter microphone may be checked. The electrical parts of the instrument, including amplifiers and indicating meter, may be calibrated with what is known as an electrical calibrator, which is adjusted to the particular sound level meter at the time of original factory calibration.

In summary, the sound level meter, reading overall sound pressure, is the basic measuring instrument, while filter-type sound analyzers of the octave or half-octave type are most convenient and effective for industrial noise analysis. Both instruments are essential for valid industrial noise studies. Haphazard evaluation of noise is dangerous and ineffective in its purpose.

The basic noise measuring and analyzing instruments have been improved tremendously by technological advances, giving far more stable, accurate, convenient and portable equipment for field use. Unfortunately, through the complexity of the human ear, sound meter measurements bear relation to loudness as determined by the ear only approximately. Complex sounds, such as most industrial noise, may sometimes be more difficult to correlate with loudness. However, by band analysis of overall intensities, together with conversion charts, meaningful correlations usually can be obtained between instrument readings and loudness as determined by ear.

Therefore, at present, the greatest weakness of the equipment lies in its inability to accurately measure transient noises such as fluctuating sounds and single or repeated impact noises. Sounds of high peak intensity are not amenable to measurement by existing instruments for field use, and only laboratory techniques at present will give accurate results. In the author's opinion, new instruments and techniques are required for measuring transient noises. This is particularly important because transient noises, being irregular, are most likely to cause stress reactions on personnel, reactions similar to the fear response, which may have adverse effects on employee morale. In addition, high intensity transient noises (blasts, for example) are particularly dangerous to human hearing.

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Picture credits: (1) American Standards Association; (2, 4, 5, 6) Herman Hosmer Scott, Inc.; (3) G. L. Bonvallet in American Industrial Hygiene Association Quarterly, Sept. 1952

Health Conference

(Continued from page 53)

ical, surgical, dental, nursing and hygiene groups concerned with health and safety in private industry and governmental agencies.

Organizations which will participate in general discussions and conduct meetings directed toward their own specific professions will be the Industrial Medical Association, the American Association of Industrial Nurses, Inc., the American Industrial Hygiene Association, the American Conference of Governmental Industrial Hygienists, and the American Association of Industrial Dentists.

The Industrial Nurse

Editor
Rosamond J. Webster
R.N., A.M., Ph.D.

Changes in First-Aid Techniques

THE AMERICAN Journal of Public Health for January 1954 reports that in a new supplement to the American Red Cross First Aid Textbook, two major changes in first aid care are announced. These were adopted by the Red Cross on recommendations by the Committee on Surgery of the Division of Medical Sciences, National Research Council.

It is now recommended that a tourniquet be used only for severe, life-threatening hemorrhage that cannot be controlled by other means; that it be applied close to the wound, with unbroken skin between it and the wound; and that it remain undisturbed until released by a physician. For frostbite or prolonged exposure to cold, rapid warming up is recommended, instead of the previously approved gradual thawing out of a frozen part in cool water or in a cool room. The victim is to be brought into a warm room as quickly as possible and placed in a tub of warm, not hot water, or wrapped in warm blankets. Rubbing the frozen part is not recommended, but, after the part is rewarmed, the victim should be encouraged to exercise fingers and toes. The supplement also includes the technique of artificial respiration, known as the Nielsen method, adopted by the American Red Cross in 1951. Full copies of the supplement may be obtained through local Red Cross chapters.

Industrial nurses, safety engineers and others whose companies employ workers exposed to severe cold, by outdoor work especially, should obtain enough copies for distribution among workers or at least to foremen and other supervisors. Instruction and interpretation of the contents of the supplement should be part of the first aid instruction.

The Official Agency

INDUSTRIAL hygiene has been effectively promoted by various large and medium-sized industrial establishments. The concern of management, engineers and medical personnel in these plants is necessarily focused on the health problems they face, but many small and even fairly large work-places are faced with industrial hygiene problems and fail to recognize them or take adequate action.

Recognition of the need for attacking these problems has led to the establishment of the industrial hygiene programs of federal and state governments; and, in some instances, those of local health departments. Many employers, engineers, physicians and others depend upon such official agencies for advice and help in dealing with health hazards of various kinds. Often such help is offered, even when not primarily requested, following a report of ill health or death subsequent to industrial exposure to some substances. Workmen's compensation claims can provide official agencies with direct clues as to possible health hazards in particular industries. Reports of hospitals, family physicians, factory inspections, health departments, and plant physicians are additional sources of information. Nearly all states have one or more professionally trained staff members attached to state health departments or to the state labor department prepared to help industries and plant physicians and nurses in seeking out the causes of industrially acquired ill-health. They are also prepared to study remedies for the hazardous situations and recommend specific measures of control or elimination. Plant surveys, field studies on workplaces, laboratory analyses of possibly hazardous substances used in manufacturing processes, help in development of in-plant medical call programs, material on exhaust ventilation and other air-control methods are all available from these agencies. These services should be used. Plant physicians and industrial nurses should contact the interested officials.

Motivation

SEVERAL controlled studies recently have indicated that there is considerable resistance to learning the facts about keeping healthy. This poses a distinct problem to industrial nurses as well as to safety engineers. If a major part of their jobs is to get workers to become alert to health and safety hazards, methods must be worked out to make educational plans effective.

An effective, though not particularly good analogy, is presented by a state health officer in the middle

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west. He notes that though health officials and others have preached for a long time on the dangers to human health of feeding uncooked garbage to swine, not much has been accomplished. Effective legislation prohibiting the practice in his state was not enacted until hogs became diseased, and died from eating such garbage. The legislators then acted quickly and passed the necessary legislation. The danger to humans did not arouse hog raisers, but when financial losses occurred, action followed quickly.

It is difficult at all times to change attitudes, habits of conduct, patterns of behavior, food habits, and other human reactions. That is why health education programs take so long to bring about changes in personal conduct, whether the change involves dieting to reduce weight, reduction of alcohol intake, limitation of tobacco consumption or many other moves.

There is a direct challenge to industrial nurses to try to learn, perhaps by the trial and error method, how best to make a health lesson effective. Perhaps the financial aspect, or the interest and well-being of the workers' families may represent the best selling points. Different groups of workers may respond to specific teachings in different ways. They must be motivated in some way that will promote their health and safety. Many methods may have to be tried. Some will work with one group; other methods may appeal to another. In any case, every effort to win their acceptance of the change is necessary.

Lung Cancer

MEDICAL literature, the radio and the public press have given considerable attention to the question of lung cancer. Even extensive advertisements by the tobacco companies have focused attention on the subject. Some competent medical investigators have stated, or at least implied, that the causative factor, or at least one causative factor, has presumably been found. Other equally competent researchers have questioned such statements, claiming that research work has not yet definitely reached a conclusion.

Why is the question of lung cancer of such importance? Some simple facts may be of help in reaching an answer. Most lung cancers appear in the age group of those over 45 years of age, which is the period in life when most cancers appear. In an extensive mass X-ray survey undertaken in Los Angeles County, out of 1,867,200 persons examined, those with suspected tumors of the lung numbered 1.9 per 1,000 examined. The significance of this finding is evidenced by the fact that such lung tumors, malignant or otherwise, are now rated as one of the major causes of death from cancer.

What can be done to eliminate or control the situation? Questions have been raised as to the causative factors to be found in air pollution, cigarette smoking and poor ventilation in working environments. None of these has yet been proved to be the specific cause. Chest physicians have recommended that full sized 14 x 17 inch films should be taken periodically, particularly of older groups in the population; and whenever possible, that this should be done twice a year. Chest surgery is imperative in nearly all cases in order to establish a diagnosis, and if possible, to help in bringing about a cure. It is evident that the routine chest X-ray examination of all those over 45 years of age—at least once a year—is essential. The films must necessarily be interpreted by a well-trained chest physician. State and local tuberculosis associations can be of help in setting up a plan to accomplish this.

Pressures from Work

AN EDITORIAL in the Journal of the American Medical association points out that there is an increasing interest in stress as a factor in the development of disease. Industrial physicians and others engaged in the physical examination of executives have been especially concerned. The so-called quasi-occupational diseases, such as hypertension, peptic ulcer, colitis, obesity, alcoholism, and others have been under observation for long periods of time without clear-cut understanding and weighing of the effects of nonoccupational as opposed to occupational tensions and situations.

There is good evidence that these stress disorders are not more prevalent in executive or supervisory groups than they are in the working populations generally.

It has been a fairly common practice to single out executives as those who are most liable to this galaxy of physical disabilities. Some groups in which tensions and tendencies to overwork are particularly pronounced are presumed to give evidence of high disability and mortality rates. A recent report stated that there was a differential of approximately 10 years in life-expectancy between the normal and the superactive groups. But sight is often lost of the over-serious, driving, overambitious workers—those who seek to attain high piecerate production records, with attendant high financial returns; also, those who by hard work during the daytime coupled with overlong hours of school attendance and study, place themselves in the category of the overworked, with exposure to physical and nervous tensions.

There may not be much that an industrial nurse can do in the case of supervisors and administrators. She can however, help to advise those who come to her complaining of headaches, of nervous symptoms, of gastrointestinal disorders—by inquiring as to how time away from the workplace is spent. The overambitious in any job or economic category are subject to the same ills when they attempt to hitch their pressing ambitions to a work-study-drive schedule which will eventually take its toll.

The Repeater

WHY do some workers come to the medical department more frequently than others? This question has troubled industrial nurses and others for a long time. There may be many reasons for this phenomenon.

A distinguished physician has called such individuals "complainers." Nevertheless, he does not advise dismissing them out-of-hand as troublemakers, hypochondriacs, or inefficient workers who want to have a smoke or get away from the job. Many of them may be just that, but there are cases in which a snap conclusion to this effect is not justified.

The individual who complains periodically of indigestion or headaches, pains in the lower spine or in the thighs, nervousness or inability to sleep—may be reporting the first symptoms of a serious disease. A bit of sympathetic and understanding questioning should help get at the root of the difficulty—whether it be somatic, psychosomatic, or mere malingering. The man who is having trouble with his wife because of her nervousness following the onset of menopause; the worker whose parent is afflicted with a chronic disease; the individual who is himself affected but does not know what the medical score is—all these and others with problems may come to the medical department for personal advice, an aspirin, etc.

The problem faced by the industrial nurse is what disposition she should make of repeaters who visit her office daily or frequently. It is not her job to attempt a medical diagnosis, to suggest treatment for the worker or his family, or to be critical of the medical attendants or members of the worker's family. She needs to steer a careful course; to attempt by careful questioning to learn what the facts are in each instance and to proceed from that point. Medical and neurological or mental examination of repeaters may be the first essential. This can best be determined by the plant physician on the basis of the facts, which the nurse can properly discover.

Continuing Education

A STUDY has been made by a statistical analyst in the Division of Nursing Resources of the U.S. Public Health Service, covering the number of nurses who have college degrees. The findings indicate that the educational level of persons in other professions appears to be higher than that of nurses. However, the available evidence indicates that the small proportion of nurses who hold degrees at present is bound to rise in the future. The number of bachelor's degrees granted in nursing rose from 893 in 1942 to 3,699 in 1952.

Of the total 374,584 nurses surveyed, 27,039 or 7.2 percent held bachelor's degrees, and 3,806 or 1.0 percent held master's degrees. The specific matter for concern is that of 11,000 nurses *in industry* only 344 or

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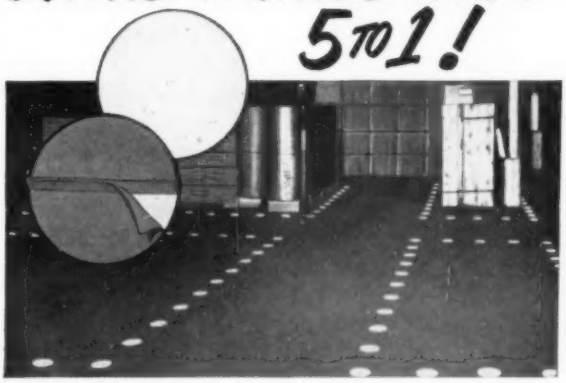

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3.1 percent hold bachelor's degrees and 20 or 0.2 percent hold master's degrees. These percentages are exactly the same for general duty nurses in hospitals, but by comparison, 16.7 percent of staff nurses in public health agencies have bachelor's degrees and 1.3 percent master's degrees.

Service in industry is a complicated procedure for nurses, when the full import of their jobs is realized. More than nursing and first aid techniques are involved. This means adequate education is essential for those nurses who serve in commercial, and especially, industrial plants. Courses in various spheres of nursing, labor law, workmen's compensation, industrial poisons, safety, illumination, ventilation——are but some areas of the job that need understanding. A course for industrial nurses, given by one medical school covers: recent advances in surgery, surgical emergencies, recent advances in medicine, medical emergencies, the nurse where no physician is in attendance, pharmacology of new drugs, problems of the aging, alcoholism, use of community resources, eye emergencies, safety programs; industrial dermatology, workmen's compensation, absentee control, records, rehabilitation, health education, counseling, employee relations, industrial medicine and management, and civil defense. This looks like a formidable list, but nurses should know these areas of their work.

Butadiene Safety Data

A NEW safety data sheet on butadiene, a chemical widely used in the manufacture of rubber products, has been published by the Manufacturing Chemists' Association. Chemical Safety Data Sheet SD-55 gives properties and information for the safe handling, storage and use of butadiene.

While handling hazards are not considered serious, exposure to the vapors of butadiene may cause minor irritations to eyes, nose, throat and lungs. Due to rapid evaporation, butadiene can cause frostbite when brought in contact with the skin. Fire and explosion hazards exist in handling butadiene as a result of the material's physical properties (boiling point—4.7°C. and explosive limits 2 percent—11.5 percent by volume in air). Air vapor mixtures can result in peroxide formation which may cause an explosion.

Complete recommendations for safety procedures to be followed in unloading, storing, handling and waste disposal are given in the safety data sheet. A section on health hazards and their control outlines proper personal protective equipment and first aid measures to be taken in the event of burns.

Copies of SD-55, Butadiene, may be obtained from the Manufacturing Chemists' Association, 246 Woodward Building, Washington 5, D. C. at 25 cents each.

Lighting Maintenance Lift

(Continued from page 21)

and on difficult welding jobs, with a minimum of manpower. The maneuverability of the truck's platform in the vertical and horizontal planes allows this work to be done at any height up to 28 feet.

All these assets help keep good housekeeping, a must in any factory, at a low cost and still obtain a maximum return in results. The company says that the full value of the truck will be returned within a year by saving in man-hours.

Time Study

In a time study, which was obtained during 4-hours and 37-minutes of cleaning operations on fluorescent lights, an accurate breakdown has been obtained as to the cost for each fixture. The operator averaged 3-minutes and 39-seconds per fixture. It should be noted that each fixture was completely cleaned and relamped and the time study included all necessary preparatory work for one-half day's operation. Assuming an hourly rate for the operator of $1.65 per hour, plus a 50 percent for overhead and indirect benefits, a labor cost of 13.3 cents per unit is represented by each cleaning. The company has thus reduced its lighting maintenance cost to less than one-fifth of what it would have been using the previous maintenance methods.

Pictures by courtesy Barrett-Cravens Company.

Learning . . . . . the hard way

AN AGITATING SITUATION

THREE different chemical plants recently proved, the hard way, that non-continuous agitation explodes them.

In the first case, benzene was being slowly added to a kettle of concentrated sulfuric acid. There was continuous mechanical agitation. After slowly adding the last of the benzene, the operator left the room. On returning he found the agitator stopped. Unthinkingly he restarted it. A fairly thick surface layer of unreacted benzene was then stirred into the acid. Because of the large volume, excessive heat resulted, benzene vapor boiled into the room and an explosion followed. Case 2 was almost identical. The agitator was belt driven, and the belt slipped. Belt dressing was applied and an explosion followed. In the third case, reactants were being added to a kettle of carbon bisulfide under a layer of water. The agitator stopped, but addition of water soluble chemicals was continued. This time the vapors that exploded were carbon bisulfide instead of benzene, but the damage was the same.

To prevent this kind of accident, agitators should be connected to chemical feed lines so addition of chemicals stops when the agitator stops. Also, personnel should be thoroughly instructed in the danger in restarting equipment when a chemical reaction is incomplete. Such a restart should be made only by the foreman or process supervisor. In many cases dumping the unfinished batch may be the only safe solution.

WHERE'S MY SAFETY BELT . . . ?

A PAINTER preparing to spray an overhead girder realized he didn't have his safety belt on. He reached for it, lost his balance, and fell 45 feet to his death. The irony of this story is not lessened by the fact that safety belts should be worn on all dangerous overhead work. The time to put on the belt is when work is first begun, not after the job has been set up. Then it can be, as this story makes terribly clear, too late.

SO IT'S STOPPED . . . ARE YOU SAFE?

THE answer is no. It is an essential first step to stop a machine before cleaning or repairing it, but stopping it does not mean it cannot be started again. An "out of order . . . do not operate" sign should be hung on the machine. If more than one person has a part in running the machine, everyone should be informed that a man is working on it. Stop and start mechanisms should be protected so they cannot be bumped accidentally. A baling-press helper in a cotton gin was killed when he leaned against the flywheel on the press compressor pump while greasing the pump. When a fellow worker pushed the pump-starter switch the flywheel caught the helper and crushed him to death.

". . . WHILE THE VEHICLE IS IN MOTION"

HOW many times do you see warnings on busses and other vehicles "Don't talk to the driver while the vehicle is in motion . . . don't get off while the vehicle is in motion?" Well, the same thing applies to machinery in industry. Never reach into a machine while it is in motion. In one instance of this kind of accident, a planer feeder was killed when he removed the guard from a planer and started to apply dressing to the moving belt, by hand! His sleeve caught between the belt and the pulley and he was dragged into the planer. There's an additional point here: don't wear loose clothing (especially sleeves) around machinery.

CONGESTION . . . INATTENTION . . . ACCIDENT

A MAN was working in close quarters moving superphosphate. Ironworkers had removed sheets from the side of the building and burnt off an angle iron 4 feet from a column leaving it jutting out into the work area. The man turned suddenly, striking his face on the angle iron. A simple accident with several contributing factors . . . the man should have paid more attention to where he was and never turned so suddenly that he lost control of his movement . . . the work space should have been less crowded . . . and, if the ironwork crew had to leave the angle iron in a dangerous condition a warning signal of some sort should have been attached to it. Safety errors add up to only one thing . . . accident!

Hearts In Industry

(Continued from page 58)

cannot cause coronary, hypertension or rheumatic heart disease. In short, there is no substance to the fiction that work can lead to any type of heart disease. Only under special circumstances can toxic materials in a job, operating for a long time, lead to high blood pressure. Only under special circumstances can certain particulate matter in the dust inhaled in certain industries lead to a special form of heart disease.

Work can aggravate the symptoms of heart disease already present, but this is either the result of an extraordinary effort unusual to the job or a progress of the heart disease independent of the job. In the former case its unusual character needs to be distinguished. In the latter, symptoms like shortness of breath, tiredness, puffy ankles or chest pain will warn the employee that he needs a checkup. It is the need to uncover the presence of heart disease which might limit full employment at one's accustomed job, that demands periodic health surveys of all employees whether executives or laborers, mechanics or office workers.

Employment Difficulties

There are some basic considerations underlying the whole problem of employing cardiacs in business and industry. We must first take note of the trend in management and labor to secure for all employees the various forms of insurance protection. Programs of workmen's compensation, social security, unemployment insurance, pensions, sickness and accident insurance, hospital, medical, surgical and medical catastrophe coverages are being provided and considered. The second basic consideration in discussing cardiac employment is that those who have significant heart impairments are generally uninsurable on an individual basis.

In the light of these two basic concepts: that cardiacs are uninsurable and that all employees tend to get insurance coverage, we may well ask "How can those with heart impairments obtain employment?" The problem is difficult but capable of solution. Group insurance is not generally concerned with the health of the individual. It requires only that the employee must be actively and consistently at work. As most heart and circulatory conditions today develop in later life, it follows that most of those who have heart disease are already in employment and are protected by various forms of insurance. The problem with this main group of cardiacs then is to educate both employer and employee to the fact that these individuals can continue their work, some in the same capacity as before, others with such readjustment as a more limited capacity for work requires.

Industrial Medicine & Cardiacs

Industrial medical departments have several important responsibilities in aiding the cardiac. Case finding of the employee with heart disease is one of these functions. Experience in one company reveals that periodic examination of apparently normal employees over 40 has discovered asymptomatic heart disease and conditions potentially capable of producing heart disease in 15 percent of those examined. Diagnosis in the acute heart case is also an occasional responsibility of industrial medical departments. The necessity for immediate electrocardiographic study in such instances is very evident; and, even in those cases where the diagnosis is doubtful, it will be necessary to place the employee off duty and specifically advise him and his physician of the situation.

The prime function of the medical service in industry is the evaluation of the employee with a heart condition. Follow-ups by periodic reexamination should be scheduled at regular intervals and this procedure is the greatest factor in keeping the cardiac worker on the job

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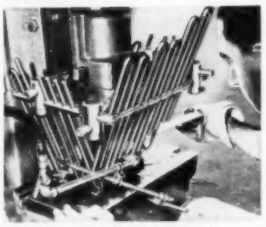

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without harm to himself. Follow-up examination often discloses a lack of progression in the heart condition, and some cases improve sufficiently so that physical restrictions are no longer required.

There is no single factor or test which can provide an objective measure of the work capacity of the cardiac. This applies to the newer clinical tools, such as the exercise electrocardiograph test and the ballistocardiogram. The examiner should try to obtain a complete clinical picture of the cardiac. Some important factors to be considered are (1) the type of heart disease, (2) the symptoms and signs of diminished cardiac reserve, and (3) the presence of other disease.

The employee should be placed in a functional classification according to criteria established by the American Heart Association, and actual recommendation should be based on the clinical findings determined from the physical evaluation of the individual. "Light work" is a generalization which should be considered a waste-basket term. In fact, work classification has to be carefully spelled out to be of any value in industry.

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Selective Placement

Placement of the cardiac in industry can be approached either by a general method whereby rather standard recommendations, such as "No lifting above so many pounds, no excessive stair climbing," etc., are made by the clinic or physician; or by a specific method adapting the worker to one specific job or type of job. The latter is applicable in those industries where specific assignment to a particular type of work is practiced. Where there is a likelihood of emergency work under conditions of stress, it becomes necessary that physical restrictions which are applied to the employee should be based on his particular physical condition rather than to the job that he may be called upon to perform.

One promising approach to the placement of cardiacs is the use of Cardiac Placement of Work Classifications Units. This promising approach is still in its infancy, but it has already revealed that most work is not too strenuous. It has also disclosed that motivation, mental anxiety, and taboos and prejudices play as great a role as the type of work to be done.

Work Classification Units

The first Work Classification Unit was set up in 1941 to assist in solving problems relating to the placement of persons with heart disease. It was believed that a better job of placement would be possible if there was some interpretation of what cardiac diagnosis stood for in the way of employment. The Work Classification Unit gave advice relating to occupational adjustment of employed persons who develop heart disease as well as advice on proper placement of cardiacs who are seeking employment. The experiences and techniques of this pioneer unit have furnished guidelines for the development of similar facilities.

The staffs of social, vocational and rehabilitation agencies have been invited to come to the units to observe their operation with the hope that better referrals will be made to the units if there is more understanding of the kind of service that is given. This is part of an educational program which eventually should increase placement of cardiacs. New York City now has 7 of these Work Classification Units, sponsored by the New York Heart Association, distributed through its boroughs.

The work evaluation of a patient is based on a 3-way approach to this problem. The units are staffed with a cardiologist, a medical social worker and a vocational counselor so that the medical, social and vocational factors may be taken into consideration before making a recommendation as to a cardiac's ability to work. The objective of

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the unit is to fit the person into productive employment. There are 2 phases (1) advising patients who have had work experience before their illness and (2) guiding young cardiacs who are looking for their first job. All the units are operating as research as well as service units to give a total evaluation of a cardiac's work tolerance and to do a follow-up study of the patient over a period of years.

On his first visit to the clinic the patient is interviewed by the medical social worker and the vocational counselor and then examined by the physician. Special emphasis is placed on a complete medical evaluation with the belief that the disposition of a given case depends heavily upon the clarity of diagnosis for success. A conference is held with the cardiologist, the medical social worker and the vocational counselor at the end of each clinic session and cases are discussed, with the total problems of the individual in mind. On the first visit laboratory tests may be ordered, if necessary, and one week later the patient returns for the first report. Persons with involved social or vocational problems may need to see the social worker or vocational counselor several times before plans can be satisfactorily worked out.

The following are requirements for referrals to Work Classification Units: (a) The patient must be known on good medical authority to have a cardiovascular disease (b) Referrals to the clinic are primarily for classification. It is not a diagnostic clinic. (c) A complete medical diagnosis must be available at the first clinic visit. (d) There must be an associated work problem. (e) Patients are expected to cooperate voluntarily in follow-up studies. (f) Cases will not be accepted where compensation claims are in process of litigation.

One Company's Approach

At the Consolidated Edison Company in New York the problem of placing and handling cardiacs has been the object of a sustained company program. The company employs many persons who are partially disabled because of physical or emotional ailments, but are able to perform productive work. In order to permit such employees to continue in gainful employment without risking their own health or the safety of fellow employees, the Medical Department imposes physical restrictions, but it does not make any decision as to the specific work assignment. It recommends physical restrictions in accordance with the physical defect present. Under this system each standard restriction is designated by a letter of the alphabet from A to Y, and the letter Z is reserved to cover any special situation which is carefully spelled out in each particular case.

The decision as to whether these restrictions interfere with the assigned duties is the sole responsibility of the employee's supervisor. Naturally, such a system requires a training program to acquaint the supervisor with this responsibility. The Industrial Relations Department is charged with the training and the Medical Department acts in an advisory capacity. When there is a question in the supervisor's mind concerning assignment in a particular job situation he can consult with the Medical Department to obtain a more detailed recommendation to fit the specific problem. This type of consultation between physician and supervisor prevents the system from becoming too rigid and allows sufficient flexibility to consider the problem of each individual employee.

The program has been in successful operation for nearly 8 years. When the employee, his physician, or his union feels that an injustice is present the case is reviewed by a special clinical examination undertaken by a senior physician. An interesting feature of the program is that nearly 46 percent of the employees with heart disease did not suffer any sick absence in 1952. It appears that the absence frequency rate is less than the company average by about 25 percent. Table I

TABLE I

JOB CLASSIFICATION OF CARDIACS

I Full Duty (72%)			
	Non-physical Workers	121	
	Physical Workers	135	
			256
II Limited Duty (28%)			
1. Job Title Not Affected			
	Non-physical Workers	193	
	Physical Workers	121	
			314
2. Job Title Affected			
	Non-physical Workers	24	
	Physical Workers	302	
			326
Total			896

TABLE II

HEART DISEASE IN INDUSTRY

LENGTH OF SERVICE	AGE IN YEARS (ACTIVE EMPLOYEES)				
	20–29	30–39	40–49	50–59	60–65
Under 1 Year	—	—	—	—	—
1– 3 Years	1	1	—	—	—
4– 9 Years	—	4	6	4	2
10–15 Years	—	2	—	—	—
16–19 Years	—	7	12	12	9
20–24 Years	—	—	80	76	38
25–29 Years	—	—	82	177	67
30–40 Years	—	—	12	173	94
41—and Over	—	—	—	5	32

shows a job classification of cardiacs in the company and the extent to which their job duties or titles are affected by their ailment. Approximately 70 percent of the employees in this study required physical restrictions because of their heart disease. There is a relative preponderance of non-physical workers such as clerks, draftsmen, inspectors, etc., among those at full duty. The non-physical workers also show an increased percentage among the limited duty cases in whom the physical restrictions do not interfere with working in the job title. It is important to note that this job summary actually covers nearly 400 job classifications in which the cardiac is doing a productive job. These include all types of clerical, mechanical, operating and engineering work.

Table II shows the age groups and length of service. It confirms that the greatest incidence of cases occurs in the fourth and fifth decades and the preponderance is in workers with over 25 years service. In fact, the average age is 55 years and the average length of service is 31 years. It is evident that heart disease affects the workers in their most productive years when their skill and experience are of the greatest use to industry.

The company's experience seems to show (1) that many cardiacs have in the past been accepted into employment and are presently employed; (2) that many heart and circulatory conditions develop in the course of employment and do not prevent the employee from continuing or returning to previous work; (3) and that the insurance coverages provided for employees through the broad principle of group insurance do not and should not stand in the way of employment of those who have heart disease and are able to work. If every member of an employee group was a cardiac, the total amount of disability would undoubtedly affect both work accomplishment and costs to such an extent that the business or industry could not be operated profitably. On the other hand, if all cardiacs and other impaired individuals were excluded from employment, the burden of their support

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would eventually fall on both employers and workers through taxation.

The best solution to the problem undoubtedly lies on a middle ground, where employers share with each other the responsibility of accepting into employment those cardiacs who can work and who come to them through natural employment channels, and keeping in their employ those who develop heart disease and who are able to continue to work.

A Cooperative Solution

Industrial and medical experience indicates that the cardiac can work, but we must recognize that there are several impediments to his full utilization in industry. While management has an economic reason for using the skill and experience of the cardiac, it does face restrictive laws, attitudes, and insurance coverage problems. In the effort to achieve widespread support for the concept that the cardiac can do a productive job there must be a reorientation in the attitude not only of the employer but also of the community, labor and the medical profession.

The solution to the problems of the cardiac worker can best be achieved by teamwork between management and labor with the guidance of the medical profession. The present scope of medical practice is limited largely to diagnosis, treatment and rehabilitation of the cardiac but the ultimate goal should be prevention, if possible, of heart disease. The increasing number of older workers who develop heart disease poses a serious problem to industry because these workers are affected in their most valuable years. Industry can meet this problem by an adequate medical service in industry and by selective placement of the cardiac employee. Experience shows that the cardiac can work and do a productive job.

Based on material from the Heart-In-Industry Conference sponsored by the New York Heart Association.

Picture by courtesy of the New York Heart Association.

Basic Materials Show

THE second Basic Materials Exposition, the product development show which had its premiere in New York last June, will be held at the International Amphitheatre, Chicago, May 17–20, it has been announced by Clapp & Poliak, Inc., New York, founders and producers.

Attendance at the first show exceeded advance estimates by a large measure. As a result, the second exposition will be considerably larger and broader in scope. Exhibition space will be more than doubled and the number of participating companies will be increased by about 50 per cent. Exhibits are limited to companies producing the basic materials which go into the making of other products. Manufacturers of end products and equipment producers may attend only as visitors.

A group of more than 20 heads of important companies will serve as a sponsoring board. Don G. Mitchell, chairman of the board of Sylvania Electric Products, Inc., again will head this group. Concurrently with the show, the Basic Materials Conference will be held.

"The results achieved by the initial show were beyond all expectations," Mr. Mitchell said. "Extensive research into visitors' reactions revealed that almost everyone discovered something new and useful for his own products."

Advance registration cards may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Illinois U. Meeting On Safety Engineering

ON April 6, 7, and 8, 1954, safety engineers and management personnel will meet on the University of Illinois campus in Urbana for the Sixth Safety Engineering Institute. This conference is sponsored by 3 chapters of the American Society of Safety Engineers located in Chicago, St. Louis, and Peoria, and the Society of Casualty Safety Engineers of Chicago, in cooperation with the College of Engineering of the University. The arrangements are under the direction of the Division of University Extension.

The conference will feature a safety gadget contest for conference members in which novel safety devices, visual aids, or models will be judged and prizes awarded. The formal program will consist of 7 subject sessions, which will bring new and timely ideas and information on Safety Engineering subjects before the conference. The topics covered include: Industrial Noise Discussion, Motion Study Applied to Safety, Inspection and Maintenance, Fire Protection Session, A Safety Clinic, Machines and Processes, How to Present New Ideas.

For a copy of the complete program, and details on registration and reservations, please write to: M. R. K. Newton, Supervisor of Engineering Extension, 116 Illini Hall, University of Illinois, Champaign, Illinois.

What's New . . .

For your convenience in obtaining descriptive literature of products listed here, use the Reader's Inquiry Card. Just write in the code number given with each item. Or send written requests to:

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SAFETY MAINTENANCE & PRODUCTION

THREE-PLY ASBESTOS MITTEN

(Use Key # 937 on Inquiry Card on page 77)

A NEW triple-ply asbestos mitten is now being manufactured by Amity Asbestos Associates. The glove is the result of a search for a solution to a problem posed by one of the company's customers. He wanted additional hand protection without clumsiness and stiffness. He had used overmittens with the ordinary gloves and was still not satisfied.

One of the company's engineers cut some samples and came up with a 3-ply mitten made from Underwriter's cloth. Usually 3 plies of asbestos with a lining would make a glove too stiff or unwieldy to wear and use comfortably. The manufacturer states that this mitten is not too stiff and can be used for a hand grip and not only for protection from heat. The gloves or mittens can be made in all the conventional sizes.

NEW PACKAGING OF FIRST-AID UNITS

(Use Key # 938 on Inquiry Card on page 77)

CELLOPHANE wrapping of units for the unit system of first aid, a special development of Medical Supply Company is now standard for all the company's units.

The company points out that the system has been adopted for two major purposes: one, to lower costs for unit system users, and, two, to give greater service in the field. With cellophane wrapping, infrequently used units will not have to be replaced because of the unit carton (not contents) wearing out. Disappearance of items from a multiple unit can always be detected, so that a man in the field does not suddenly find an item missing just when he needs it. Inspection time is cut substantially, since it is not necessary to open every unit package to determine contents. Every unit gets continuous protection because units in the kit are protected against leakage due to partially used and improperly sealed items, such as tubes, vials, bottles.

Along with the cellophane wrapping development, the company also has introduced a new bronze and tan color scheme for its unit system first aid kits and units. Kits are finished with a new hard-finish bronze baked-on enamel that withstands scuffing, weather and abuse.

LIGHTWEIGHT WATERPROOF SUIT

(Use Key # 939 on Inquiry Card on page 77)

THE John E. Dorsey Company announces a new guaranteed waterproof, lightweight suit for utility linemen, highway crews, outdoor service crews, etc. The suit does not crack or deteriorate when stored. It gives complete protection for as long as 10 years, the manufacturer reports. The jacket has a self-ventilating open front, and a double ventilated back. An elastic cuff prevents water from leaking inside gloves worn on outside of sleeve. Snug-fitting elastic pleated back prevents drafts. The overall pants have a bib front and web braces. The lined parka hood is roomy enough to allow a safety helmet to be worn inside it. There are no metal accessories on the suit. A pocket and cigarette holder are built inside bib front to keep articles dry even in driving rain. The suit has already been approved by several safety committees.

GLASS-FIBER FIRE HOSE

(Use Key # 940 on Inquiry Card on page 77)

A REVOLUTIONARY improvement utilizing the high strength of glass fiber yarn in the manufacture of lightweight fire hose has been announced by the Boston Woven Hose and Rubber Company, manufacturers of industrial rubber products.

The new Boston Glass Fiber Fire Hose is 20 pounds lighter per 100 feet than conventional cotton hose, and is even lighter than hose made with other synthetic fibers . . . yet the new hose is far stronger. In tests, heavy trucks were driven many times over the hose while under full pressure; subsequent tests and x-ray examinations showed no damage to the hose. In addition to extreme lightness and strength, the new fiber glass fire hose is far more compact. Where a 50-foot length of conventional cotton hose will form a coil approximately 28 inches in diameter, an equivalent length of glass fiber hose forms a coil of only 24 inches diameter or less. Still another advantage lies in the fact that the glass fiber yarn, which is specially treated, does not absorb water. As a result the hose when wet is much lighter and remains more flexible at low temperatures. Because of the higher strength imparted by the glass fiber yarn, a hose of conventional outside diameter can be made with thinner wall, thus permitting a larger bore which will handle more gallons of water per minute.

FIRE INSTRUCTION STICKER

(Use Key # 941 on Inquiry Card on page 77)

FREE dashboard stickers to show truck drivers how to put dry chemical fire extinguishers into action can be obtained from Ansul Chemical Co.

The stickers, measuring 5 inches by 3 inches, are intended to be placed on dashboards of trucks and other vehicles. Illustrations show the steps necessary to put the extinguishers into action. Ansul officials believe the drivers will gain beneficial knowledge on the subject, especially during long traffic delays when they have nothing to do but sit and absorb the instructions in front of them. To obtain a set of the stickers, use the key number shown above on the Reader's Inquiry Card.

PLASTIC EAR PLUG

(Use Key # 942 on Inquiry Card on page 77)

A NEW safety device called AURA Soft Plastic Ear Protectors has been announced by Oral Art Earmold Laboratory. According to Robert E. Mitchell, Vice President in charge of research, these custom built ear protectors are made of the same non-toxic inert material now being successfully used by the company in the production of its custom line of earmolds for hearing aid wearers.

The special feature which will appeal to industrial workers is its comfort wearability. These protectors have the feel of natural skin and rest without irritation against the soft tissues of the ear. Sound is not absolutely eliminated by the protectors, but is reduced to a minimum. A booklet, "Directions for taking Accurate Impressions of the Ear," and complete information about the soft plastic ear protectors is also available.

SAFETY TRAINING KIT

(Use Key # 943 on Inquiry Card on page 77)

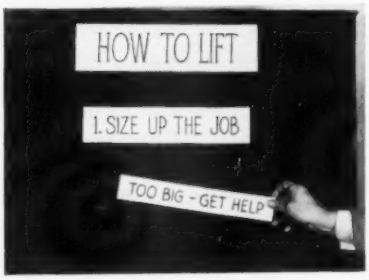
SAFETY training and public speaking in general have been made easier and more effective by the new, inexpensive easy-to-use "Friction Board Kit." In designing this new visual aid, the Chase Bag Company has utilized the natural affinity of one fuzzy material for another. The Friction Board permits the placing of pictures, signs and symbols in any position on its flannel display surface with complete assurance that these visual aids will stay put.

An attention-arresting feature of the Friction Board is that signs, pictures and symbols appear to stick to the flannel display surface as if they were magnetic. Actually the principle is far simpler. Like the meshing of two hair brushes pushed together, the long fibered fuzz on the back of the visual symbols interwinds with the fuzz on the flannel board, causing the symbols to stay in place until removed. In addition, "motion" is possible, since the symbols can be moved about or taken off easily.

The Friction Board combines the best features of the black-board and flipover chart, without their disadvantages; and

by enabling the speaker to disclose one element of his talk at a time, the visualization is greatly animated and makes feasible an effective talk.

A generous supply of heavy, fuzzy (or flock) backed paper is included in each Friction Board Kit, from which the signs and symbols are easily fashioned. The kit also includes the smart, lightweight carrying case pictured above, which measures 17" x 30" and makes the kit as portable as a brief case. This sturdy carrying case opens up to form the 34" x 30" display board (below).



In preparing a talk, the major points to be discussed are written on separate pieces of the fuzzy-backed paper, to be placed, together with any pictures or symbols, on the flannel surface as each point is reached in the talk. This method of presentation helps the speaker feel at ease, since the series of signs and pictures covering the major points, serve as reminders and dramatize the points under discussion. But, more important, they increase the speaker's ability to hold his audience and get his message across.

Not only is the Friction Board an excellent tool for Safety Training, but it is also an effective aid in presenting advertising, sales training, financial, organizational and instructional talks of any kind. Also available is a kit for use where portability is not required.

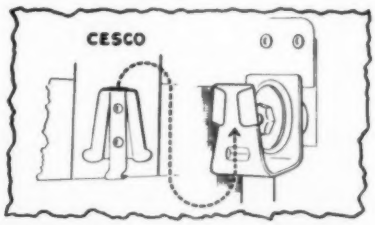
FLAME-PROOFED COTTON DISPOSABLE TOWELS

(Use Key # 944 on Inquiry Card on page 77)

DEVELOPMENT of a process to flameproof a new, all cotton, disposable towel for industrial use is announced by B. J. Petricoff, president of the Leshner Corp., producers of wiping cloths and industrial textiles. Mr. Petricoff said the fire-resistant treatment will remove the major objection of some industries to replacing cloth wipers and towels with cotton towels.

The Corporation perfected the new material after 13 years of research to replace conventional wiping cloths that have been a major problem in cost and maintenance. The new towel is said to reduce wiper costs as much as 50 percent in factories now using rental wipers. The product has the same area as washed shop towels. It absorbs more than 6 times its own weight in grease, oil or water and may be used for wiping, cleaning, polishing or other industrial uses. Other advantages, according to the company, are that all towels are uniform in size, quality and weight; may be used wet or dry, eliminate hazards of grease-soaked rags; are sanitary and accepted enthusiastically by workers because the towels are manufactured and packaged by machinery, and cost-wise, result in substantial savings for companies.

The flameproof towel is offered in colors of pastels or dark shades and white. Size is 12" x 18" but will be cut to individual specifications.



INTERCHANGEABLE HEAD-GEAR MOUNTING

(Use Key # 945 on Inquiry Card on page 77)

A NEW way to save money on the purchase of head, face, and eye protection equipment has just been announced by the Chicago Eye Shield Company. It consists of combinations of a head gear and helmet, or plastic shield, or wire screen shield; or hard hat with the same protective equipment.

The basis for making these combinations is the new Cesco mounting device. It consists of wedge shaped brackets which slide together and lock securely, and which may be as quickly unlocked. A tilting mechanism allows the user to raise or lower the helmet or shield without difficulty, and an easily adjusted tension spring compensates for the difference in weight of the different pieces. With five pieces of equipment consisting of a head gear, hard hat, welding helmet, plastic shield, and a screen shield, it is possible to make 6 combinations which formerly required 12 items.

ROLLING STEP LADDER

(Use Key # 946 on Inquiry Card on page 77)

PRECISION EQUIPMENT CO. announces production of all steel "automatic action" safety step ladders. The ladder may be easily rolled to the desired position; but, as soon as a person steps on it, the casters automatically disengage locking the ladder in place. There need be no fear of rolling, swaying or "kick out" with these safety step ladders. The rubber tipped legs "lock" to the floor, providing a firm, sure base. When a person steps off the ladder the casters instantly and automatically re-engage. The ladder can then be moved easily and quickly.

The ladders are designed for use in industrial plants, garages, stock rooms, warehouses, file departments, as well as in all types of offices, wherever material is stored above reach. Aluminum-finished steel is used in their construction. Frames are of ¾" steel tubing. Reinforced expanded steel make up the non-slip step plates. The larger 4- and 6-step models are furnished with handrails. An optional feature on these larger ladders is a detachable, wire mesh basket, 12" x 15" x 8" which saves time by permitting larger loads and fewer trips.

JOB CLASSIFICATION TEST

(Use Key # 947 on Inquiry Card on page 77)

A NEW, scientific tool for personnel directors is announced by Science Research Associates, Inc. It is the new series of tests, FACT—Flanagan Aptitude Classification Tests—consisting of 14 critical job elements which have been found through on-the-job analyses to be the necessary skills of 18 different occupations.

The occupations for which the test has been validated are: Accountant, artists, business man, chemist, office clerk, draftsman, electrician, engineer, machinist, mathematician, mechanic, airplane pilot, plumber, printer, salesperson, secretary, structural worker, writer. Various combination of these skills are needed for an individual's success in a given occupation: (1) inspection (2) coding (3) memory (4) precision (5) assembly (6) scales (7) coordination (8) judgment and comprehension (9) arithmetic (10) patterns (11) components (12) tables (13) mechanics, and (14) expression.

The test battery was developed by Dr. John C. Flanagan, professor of psychology at the University of Pittsburgh. Follow-up studies of 1,600 high school seniors who were first given the battery in 1947 indicate those who showed high aptitudes in given occupations and pursued those occupations progressed far more steadily and favorably in pay scale and responsibility than those scoring less well. Most occupations do not require high abilities in all 14 skills measured by the tests. Rather, different occupations require different combinations of the 14 skills, e.g., a successful electrician possesses different abilities from those of a successful salesman.

To assist personnel directors in gaining a complete picture of the potential employee's success on the job, Science Research Associates has prepared a "Job Test Chart" for industrial selection and placement. This lists achievement, personality and interests tests to be given in conjunction with the job-skill battery to assure that the individual is "right" in all aspects for the position. The job classification tests are easy for the personnel director to administer and score through easy-to-understand manuals. Although the complete battery takes more than 5 hours to finish, individual tests vary in length from 2 minutes to 40 minutes, depending on material involved. A majority of the occupations require 3 to 5 tests and can be administered and scored in about an hour.

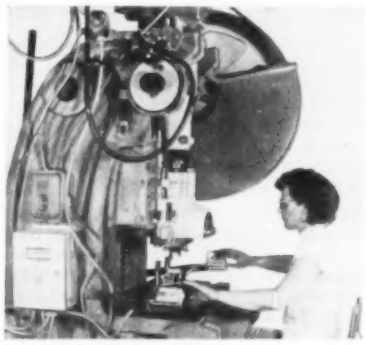
LONG LIFE LAMP REFLECTOR

(Use Key # 948 on Inquiry Card on page 77)

AVAILABILITY of Abolite lamp reflectors with all-white titanium lifetime porcelain enamel finish, and ventilator slots has been announced by Abolite Lighting Division, Jones Metal Products Co.

The new all-white finish is available at no additional cost. The manufacturer describes the all-white titanium finish as being the "whitest white" ever developed . . . a surface that floods more brilliant light to provide maximum lighting efficiency. The finish is vitreous fired to steel reflector shells; it is glass-smooth and resistant to weather, chemical and oil fumes. Cleaning is easier, less maintenance required. The new reflectors are attractive in appearance and add a modern, decorative effect wherever used, it is stated.

Ventilator slots, the other new feature, are reported to contribute greatly to lighting efficiency and economy. Air automatically circulates around the lamp and through the ventilator slots to keep dust and grime on the move. According to company engineers, this design provides 7% more up-light in line with modern lighting standards. Lamp necks stay cooler to provide longer lamp life. Tested with 1000 watt reflectors, lamp neck temperatures were reduced an average 40° F. All reflectors accommodating 200 watt lamps or over can be supplied with ventilator slots at no extra cost.

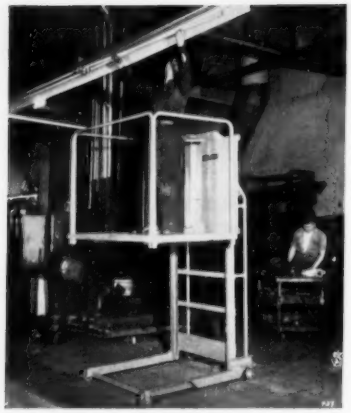


PRESS SAFETY CONTROL

(Use Key # 949 on Inquiry Card on page 77)

A TWO-HAND clutch control for manually operated power machines, that is said to increase production up to 25 percent and affords complete protection for operators and set-up men, is announced by Micro, a division of Minneapolis-Honeywell Regulator Company. The unit, called Micro Trip, is available as a package for installation on existing presses.

The device has an instantaneous electrical response, and a light touch actuation that reduces operator fatigue. Also contributing to increased production, the manufacturer states, is the fact that the device gives an operator assurance of complete safety. The control device prevents tying down or cheating because its 2 control switches must be pressed simultaneously to operate the press. If one switch is pressed before the other one, the tripping mechanism becomes inoperative and must be reset by a button on the control box. The device may be used with single switch control in applications where one hand is otherwise occupied. It is ideal for multiple operator installation, the manufacturer adds. Electrical signal systems can be tied in. Also, it permits single stroke control for positive mechanical clutch machines and automatic cycling control for hydraulic, pneumatic or friction clutch machines.

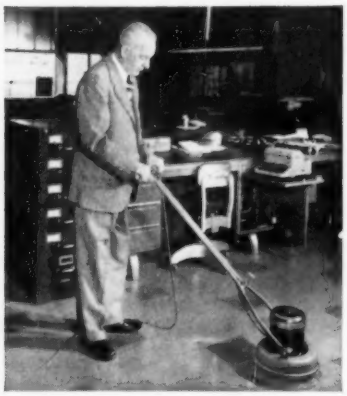


HAND LIFT-PLATFORM

(Use Key # 950 on Inquiry Card on page 77)

SERVICE Caster & Truck Corp., introduces "The Bootstrapper" to meet the need for a lifting unit on which a man may raise and lower himself with a hand crank.

With a capacity of 500 pounds and platform 36" x 60" and removable pipe railings, the device is a cantilever type with hand winch mounted on the carriage permitting the operator to raise and lower himself while standing on the platform. Factories, schools, offices, and public buildings will find the product helpful for maintenance chores and for repairing tall machinery. It has caster steer with a foot-operated floor lock mounted between the swivel casters. While the lifter pictured has a lift of 5'0", models are available with higher lifts, and with-or-without pipe lowering hinge t pass through doorways.



COMPACT FLOOR MACHINE

(Use Key # 951 on Inquiry Card on page 77)

THE Hild Model "K" Floor Machine is priced substantially lower than other models, yet matches the performance of larger machines, according to Hild Floor Machine Co.

Model "K" is equipped with a powerful 1/3 H.P. heavy duty vertical motor which requires no lubrication. The 12½ inch brush spread and brush speed of 210 r.p.m. assure lively action for a hard finish on all waxed surfaces. Attachments are available to scrub, wax, polish, buff, sand and steel-wool floors of all kinds. The machine weighs only 34 pounds . . . 38 pounds with brush attached. It runs quietly so maintenance work can be done at any hour without disturbing occupants of adjoining rooms.

A feature of the machine is an efficient new power transmission system. Power is transmitted from motor to brush through a cog tooth belt made of tough rubber and nylon, reinforced with multiple strands of steel cable embedded in the rubber. It is quiet running and requires no lubrication. The machine has a steel base with baked-on enamel crinkle finish and is fitted with a bumper of non-marking grey plastic. The handle is made of steel tubing, fitted with rubber grips and a cast aluminum switch box. A 30-foot non-marking grey rubber cord is furnished.

ELASTIC KNUCKLE-BAND

(Use Key # 952 on Inquiry Card on page 77)

SOME of the toughest spots to bandage properly are knuckles, finger-tips, elbows, toes and heels. To overcome this problem, a new type of elastic bandage is now available in first aid kits, unit packs and bulk, made by the E. D. Bullard Co.

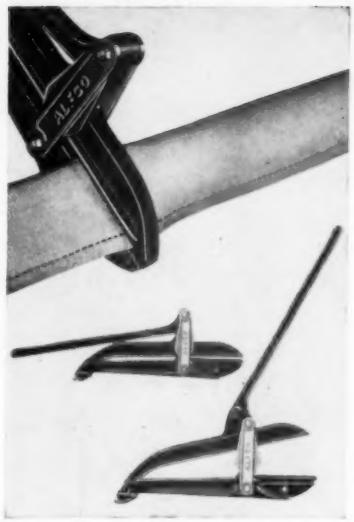
The elastic Knuckle-Band is made of woven elastic adhesive 3" long and 1½" wide. In the center a 1" x 1½" wide sterile gauze dressing, large enough to adequately cover all knuckles, is securely attached. The elastic design gives freedom of movement without bunching behind the knuckle. The bandage will fit over thumb and finger tips and will stick tightly when applied. The design reduces the actual size of the knuckle-band as the ends are folded around the knuckle or finger tip covering only the affected area. The new adhesive leaves no marks on the skin and is easily removed. Because of the weave and especially prepared adhesive plastic formulated to U.S.P. specifications, the bandages are non-irritating.

HOSE SHUT-OFF

(Use Key # 953 on Inquiry Card on page 77)

A NEW 3-in-one hose shut-off device has just been introduced by the American-LaFrance-Foamite Corporation. The Alfco Hose Shut-Off can be used effectively on 1½", 2½", and 3" double-jacket fire hose. It can be switched from one hose line to another in only the time it takes to operate the hand lever—no adjustments of any kind are necessary.

A downward pressure on the operating



lever securely locks the hose shut-off in place. Less effort is required to shut off a charged line as body weight can be utilized in the downward thrust. The hose shut-off can be used for quick shut-off of hose line—taking out and replacing broken lengths of hose—adding hose to a charged line—changing a nozzle—connecting a Siamese, cellar nozzle or standpipe—draining a hose line for carrying up a ladder. The unit is made of steel, with a weather-resisting painted finish. Cadmium-finished brackets are available for mounting purposes.

INSULATED RUBBER GAITER

(Use Key # 954 on Inquiry Card on page 77)

BEACON Falls Rubber Footwear announces the production of an olive-drab, net-lined gaiter for extra warmth in cold weather. The gaiter has a built-in layer of plastic foam insulation over vamp and ankle and an insulated mid-sole. The gaiter is extremely durable, the manufacturer states, and will not stiffen or crack in cold weather. Punctures to outer surfaces will not lessen insulation values. The gaiter is 12 inches high and has a non-skid design outsole, and a steel shank for support. It is ideal protection for industrial work, outdoor or indoor, where it is necessary to protect against cold footing conditions.

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

PERSONAL PROTECTION

Ear Valve 315
Sigma Engineering Co. Diagram shows how valve operates to take out unwanted noise, yet allows conversational tones to be heard. Bulletin also tells where valve can be used. Emphasizes comfort. Discusses differences from other types of ear protection.

Coated Work Gloves 316
The Granet Corp. Brochure pictures 5 types of gloves coated with neoprene. Chart shows resistance to various chemicals. Shows how testing procedures assure glove quality. Specifications given for each glove.

Asbestos Mittens 317
Safety Clothing & Equipment Co. Illustrated gloves range from overmitts, reversible mitts, one-fingered gloves, enamelers' mittens, and slip-over patches to leather-reinforced mitts. All Underwriter's grade asbestos. Specifications included.

Canister Gas Masks 318
Acme Protection Equipment Co. Emphasis is placed on clarifying proper application of the equipment. Bulletin covers construction, life, gas concentration determination, and gives specific fire-fighting, industrial, and chemical applications. Illustrated table of mask equipment shows proper parts needed for individual uses.

Plastic Eye Protectors 319
Watchemoket Optical Co., Inc. Better resistance of plastic eyewear to impact, chemicals, and sparks plus finer optical qualities are featured in 11-page catalog. Retractable temples, lens shapes, colors and ease of lens changing are also noted. Line of plastic lens glasses, goggles and face shields illustrated.

SANITATION

Heavy Duty Skin Cleanser 320
G. H. Packwood Mfg. Co. Complete line of industrial skin cleansers listed. Stress laid on heavy duty cleanser. Cost, approval of hygienic authorities, and tested quality also receive attention. Use in radioactive areas noted.

Germicide 321
Huntington Laboratories, Inc. Report on use of germicide in hospitals. Test results of use in decontaminating instruments against various kinds of bacteria given. Corrosion test shows germicide non-corrosive. Contains G-11.

Electric Hand Dryer 322
The Chicago Hardware Foundry Co. The wide variety of applications of the dryer and its maintenance savings given most attention in this brochure. Clean, neat washrooms from dryer's use also explained. Various types of hand, boot and glove dryers pictured.

AIR & FUME CONTROL

Catalytic Exhaust 323
Oxy-Catalyst, Inc. Catalytic units, which remove carbon monoxide and other harmful fumes, are diagrammed and their action explained. Numerous applications. On trucks, catalyst permits their use in poorly ventilated areas, literature explains. Results of tests on trucks diagrammed.

Abrasive Wheel Hood 324
Slonneger Products Co. Self-filtering feature of hood permits reclamation of usable metals. Booklet covers hood operation with detailed text and parts illustrations. Snagged parts are deflected by hood to protect operators.

Air Conditioner 325
Dravo Corp. Designed for areas where heat, dirt or fumes create dangerous working conditions. Capacities and dimensions listed. All mechanical features explained.

MACHINE GUARDS

Adjustable Enclosure Guard 326
Searjeant Metal Products, Inc. Action pictures show operation of adjustable milling machine guard. Text describes elimination of injury from caught sleeve, ring, etc. Dimensional data sheet included.

Sweep-Guards 327
Weisman Mfg. Co. Detailed diagrammatic drawings of the sweep guard attached to various types of presses feature this booklet. Series pictures show action of guard. Different ways to attach to presses. Operation facts in text.

Electric Clutch Control 328
Micro Switch. Light and rapid control, freedom for operator, and "uncheatable" safety are important features of press switches in this catalog. Illustrations and detailed text cover line of foot, hand, foot and hand, clutch control, limit, and many other safety switches. Chart of equipment needed for different means of control included.

FIRE PROTECTION

Safety Tanks 329
American Safety Tank Co. Crash resistant, spill proof, non-explosive truck gas tanks subject of booklet. Cutaway drawings explain safety features. Specifications for installation kits for various tanks given. Special equipment also fully described.

Safety Cans 330
The Protectoseal Co. Fire baffle and squeeze-grip handle are emphasized features of safety can. Bulletin shows safety features of can in action. Specifications listed.

Fire-Resistant Paint 331
Morris Paint & Varnish Co. Photos of fire-resistance tests of this paint feature this bulletin. Text details test results also. Ability of paint to check fire spread carefully explained.

Portable Extinguishers 332
Walter Kidde & Co., Inc. What type of portable extinguisher to use on what size and kind of fire, how to operate it, capacity, range of stream, recharging period, extinguishing effect, effect of freezing . . . all information given on single chart in this catalog. Line of portable extinguishing equipment also illustrated and described. Carbon dioxide, smoke detection and fire detection systems included.

FLOOR MAINTENANCE

Industrial Floors 333
The Monroe Co., Inc. Differing floor requirements for varying industries made clear.

(Continued on next page)

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Free Bulletins (Cont'd)

Floor analysis form describes maintenance problems and solutions for each type of floor. Methods of application, uses and qualities of company's floor materials also covered. Plentiful "how to" illustrations.

Safety Treads **334**
Wooster Products, Inc. Sectioned catalog has full-size cross-section illustrations of groove and abrasive treads, cast and abrasive thresholds, plates, curb bars, window and elevator sills, etc. Explanatory installation sketches. Designed for file reference.

Floor Absorbent **335**
Wyandotte Chemicals Corp. Safety and all-purposeness are central features of floor absorbent detailed in comprehensive brochure. Use of floor absorbents in industry explained, advantages of product charted, flame and breakdown resistance test results shown in photos. Applications illustrated.

INDUSTRIAL MAINTENANCE

Safety Solvents **336**
John B. Moore Corp. Single chart shows qualities and uses of 8 safety solvents. Specific gravity, flash point, boiling point, distillation range, color, viscosity, evaporation rate, corrosion rating, and miscibility among features rated. Data sheet prepunched for binder file.

Lighting Maintenance **337**
General Electric Co. The goal of comfortable seeing is the subject of this bulletin. Fixtures with upward reflecting light and adequate shielding called one step toward goal. Reflectance values also important. Applications of new style lighting in various industries illustrated and detailed.

Color Paint Guide **338**
Tropical Paint & Oil Co. Colorful brochure describes maintenance painting to aid employees' seeing ability. Safety color code included. Company's paint categorized to fit proper coloration for varying areas.

Safety Solvents **339**
Nocon Products Corp. Six safety solvents to replace carbon tetrachloride covered in bulletin. How to apply, uses, safety factors, and specifications given for all solvents. Range: slow-drying to very fast drying.

Hose Clamp Uses **340**
Punch-Lok Co. Twenty-four pages of different uses for hose clamps. Booklet covers rubber, metal, rope, electrical wiring, etc., applications. Ideas fully illustrated and explained. Practicality emphasized.

MISCELLANEOUS

Special Marking Problems **341**
W. H. Brady Co. Special industrial marking problems are attacked in this bulletin. Self-sticking markers, specifically designed for each special need, include inspection, instruction, serial number, wiring diagram, coil marker and other types of labels. Specifications for various sizes given.

Industrial Decals **342**
United States Decal Co. Decals for fire protection get most attention in brochure. Also included: vehicle decals, "keep distance" car warning, civil defense insignia, extinguisher data, etc.

Index to Advertisers and their Agencies

American Optical Co., *Sutherland-Abbott, Boston* ..... Inside Front Cover
Ansul Chemical Co., *J. A. Cormack, Milwaukee* 49

Bausch & Lomb Optical Co., *Ed. Wolff & Associates, Rochester* 7
Brady Co., W. H., *The Brady Co., Inc., Appleton* ..... 61 & 65

Carbisulphoil Co., *Tracy-Locke Co., Inc., Dallas* 70
Chesebrough Mfg. Co., Cons'd., *Noyes & Sproul, Inc., New York* 52
Chic Maid Hat Mfg. Co., Inc., *Armand S. Weill Co., Inc., Buffalo* 70
C-O-Two Fire Equipment Co., *G. M. Basford Co., New York* 44
Cover, H. S., *Jerry Bryant Advertising Agency, Chicago* 33

Dilley Manufacturing Co., The 71
Du Pont de Nemours Co., Inc., E. I., *Batten, Barton, Durstine & Osborn, Inc., New York* 18
Davenport & Son, Inc., A. C., *Gerstel-Loeff, Chicago* 68

Edmont Mfg. Co., *Mumm, Mullay & Nichols, Inc., Columbus* 10

Fine Organics, Inc., *Kermin-Theil Agency, New York* 50

General Electric Co., *G. M. Basford Co., New York* 47

Hamerslag Equipment Co., *Merchandising Factors, Inc., San Francisco* 8
Hillyard Chemical Co., *Phillips, Reick, Fardon, Kansas City* 9
Hood Rubber Co., *Henry A. Loudon Advertising, Inc., Boston* 31
Hynson, Westcott & Dunning, Inc. ..... Back Cover

Industrial Gloves Co., *Kirkgasser-Drew, Chicago* 34

Junkin Safety Appliance Co., *Farson, Huff & Northlich, Louisville* 37

Legge Co., Inc., Walter G., *J. M. Kesslinger & Associates, Newark* 32
Lehigh Safety Shoe Co., *Frederick-Clinton Co., Inc., New York* 2
Lightfoot Schultz Co., *Herald Advertising Agency, Inc., New York* 59
Littell Machine Co., F. J., *Vernon S. Weller, Chicago* 69

Martindale Electric Co., The, *Kenneth H. Kolpien, Cleveland* 66
Metal Arts Company, Inc., *Hutchins Advertising Co., Rochester* 71
Morton Salt Co., *Needham, Louis & Brorby, Inc., Chicago* 43

Patent Scaffolding Co., Inc., The, *Glenn, Jordan, Stoetzel, Inc., Chicago* 4
Pennsylvania Optical Co., *Werner E. Pfeiffer Co., Reading* 39
Penetone Company, The, *King Advertising Agency, New York* 64
Pittsburgh Plate Glass Co., *Maxon, Inc., Detroit* 17
Pioneer Rubber Co., The, *Carr Liggett Advertising, Inc., Cleveland* 58

Quabaug Rubber Co. 11

Safety Box Toe Co., *The Church Green Co., Boston* 27
Safety Clothing & Equipment Co., *Kenneth H. Kolpien, Cleveland* 41
Searjeant Metal Products, Inc., *Kamb, Meteyer Advertising Agency, Rochester* 68
Silicone Paper Co. of America, Inc., The, *Package Advertising Co., New York* 5
Sigma Engineering Company, *Walter Du Bree, Los Angeles* 72
Stonehouse Signs, Inc., *Walter Du Bree Advertising Agency, Los Angeles* ..... Inside Back Cover

Torit Manufacturing Co., *Ray C. Jenkins Advertising Agency, Minneapolis* 62

Watchemoket Optical Co., Inc., *Richard Thorndike Agency, Providence* 12
Wilkins Co., Inc., The, *Laux Advertising, Inc.* 1
Williams Jewelry & Mfg. Co., *Vernon S. Weller, Chicago* 30

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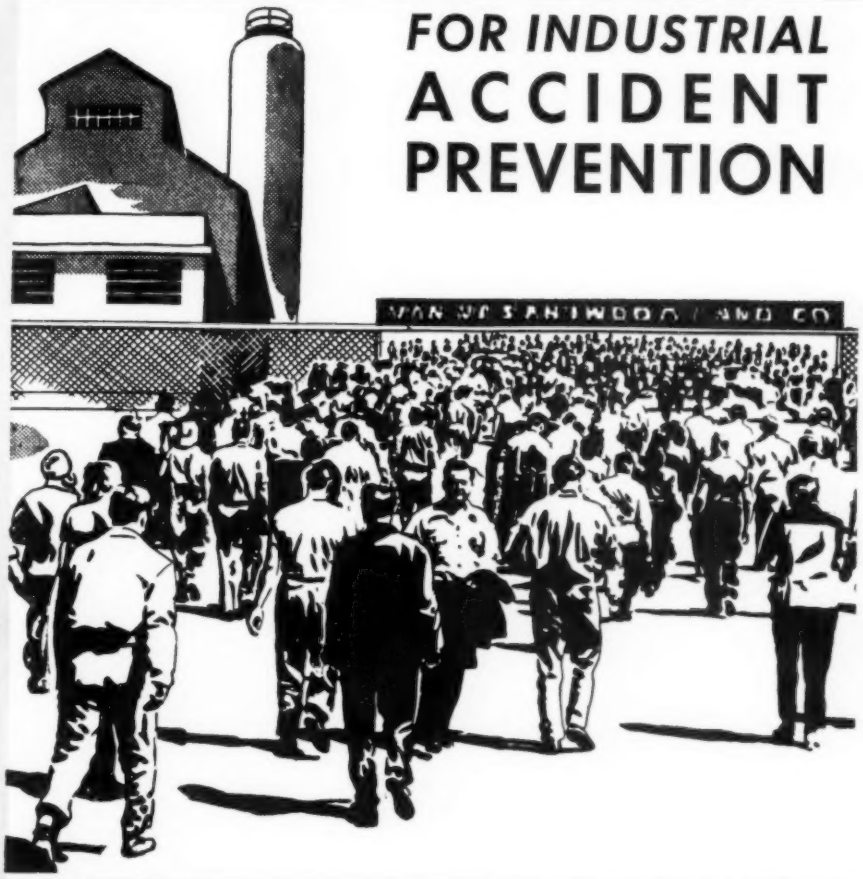

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(For full details, use Key # P-45 on free Inquiry Card on page 77)

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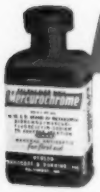

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